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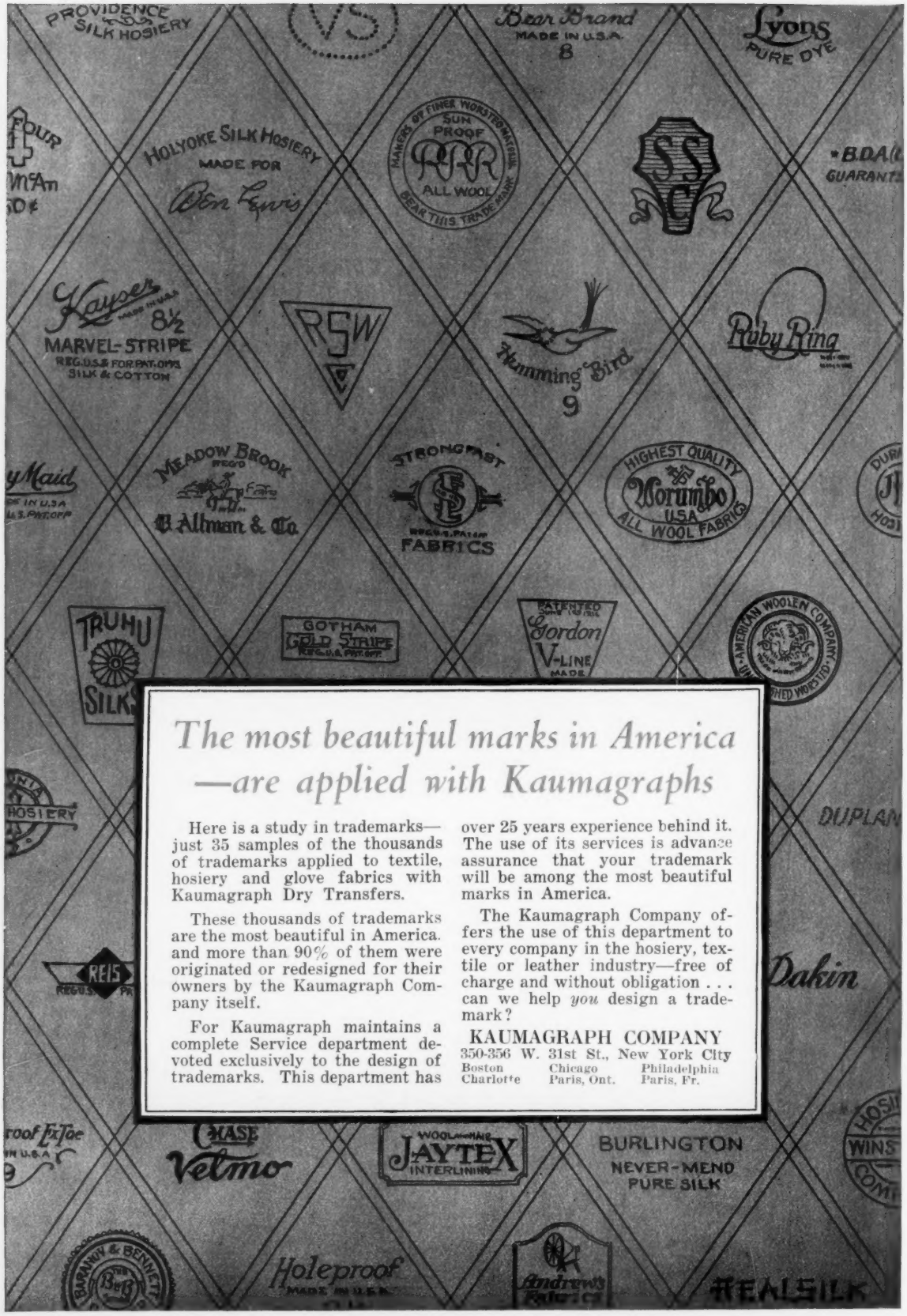
BOTH
Production and Profit

can be increased by proper drainage of slashers, dryers and all other steam heated equipment.

MOREHEAD MANUFACTURING CO.
DEPARTMENT C — DETROIT, MICHIGAN
(215)

Morehead
Back to Boiler
SYSTEM



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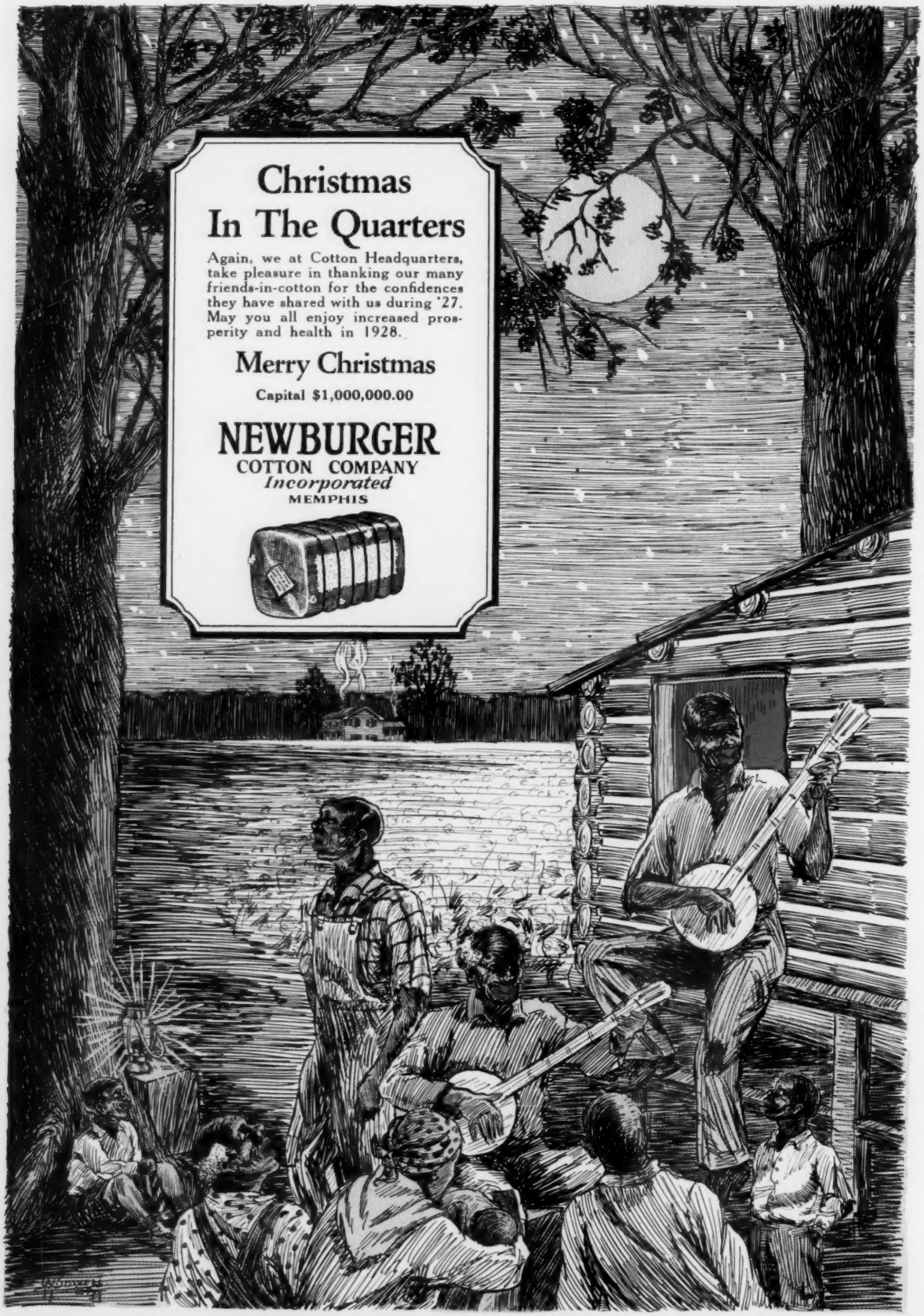
Christmas
In The Quarters
Again, we at Cotton Headquarters, take pleasure in thanking our many friends-in-cotton for the confidences they have shared with us during '27. May you all enjoy increased prosperity and health in 1928.
Merry Christmas
Capital $1,000,000.00
NEWBURGER
COTTON COMPANY
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MEMPHIS

COTTON UNIFORMS FOR MILL WORKERS WINNING RECOGNITION.

How the Failure of "Dad's Cotton Crop" Developed an Idea That has Grown into a Business.

BY KATHRYN ROMIG McMURRAY.

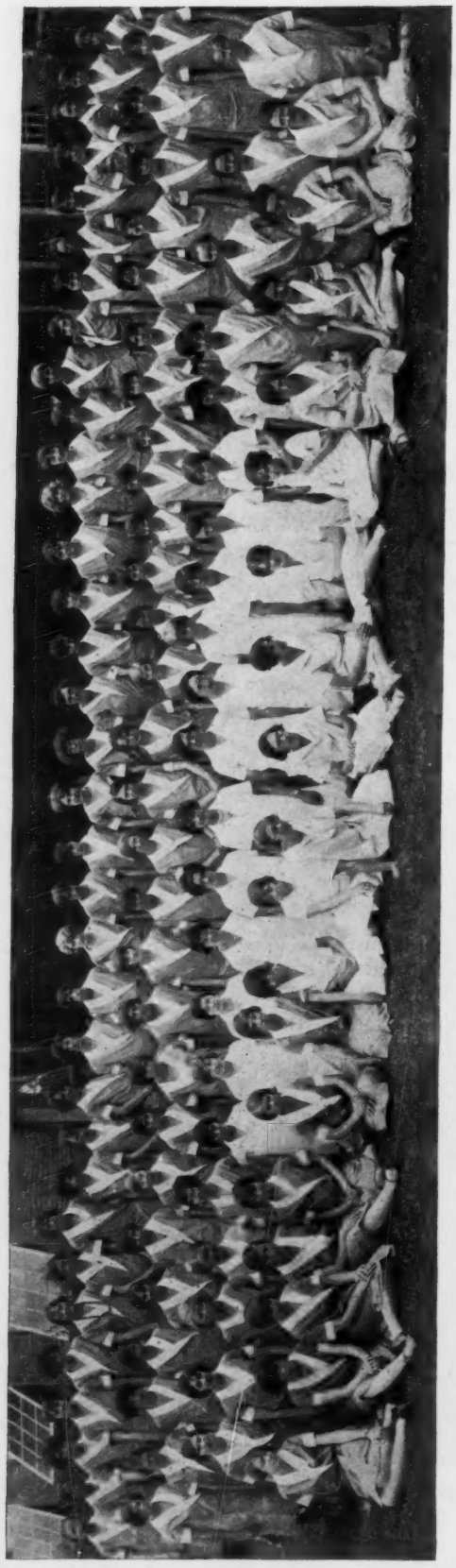
Uniform dress originated in the fighting forces of earliest times when some mark of identification was necessary to distinguish friend from foe. At first temporary badges, such as red and white roses during the War of the Roses, served the purpose. The complete dress uniform was not heard of until King Henry VIII clothed his royal archers in white gaberdines with caps of a standard design. By the beginning of the seventeenth century each of the national armies of Europe had their distinctive dress. The value of military uniforms was readily recognized and today it is of such importance that it is part of the first equipment purchased.

From the military world uniform dress has spread to numerous trades and professions, lending them dignity as well as distinction. As all the world loves a lover, even so all love a uniform, and respect it. A letter delivered by the substitute carrier in civilian clothes does not bring half the thrill of the mere sight of the man in blue. The sick man refusing the medicine offered by his family drinks it like orange juice when presented by a white-uniformed nurse—not because of the personality of the woman but because of his respect for all her uniform represents.

The woman who disregards speed and traffic laws, although repeatedly warned by her husband or her dad, meekly obeys them when the suggestion is made by one wearing a blue coat with brass buttons, or by a khaki-clad man cycling up behind her—not that she fears the man, but because she respects the implications of the uniform. Red Cross nurses, Salvation Army lassies, Sisters of Mercy can go unmolested where they will because their uniform proclaims their service to mankind and demands the respect of even the vilest outcast.

Three young ladies employed at the Holston Mfg. Co., Knoxville, Tenn., one of the first plants to adopt this method of uniforms. The girl in the center originated the idea of uniforming the girls at the Holston plant, a story of which was published in the August issue of Cotton.

The outstanding purpose of the present day uniform is not for distinction, but to provide the most appropriate dress for the particular kind of work done by the wearer. For long years men have appreciated the value of dressing for their work but most women have not. Imagine, can you, a man going to his office in his slightly worn tux and patent leathers? No you can't for it simply isn't done. Yet daily one sees many a girl "wearing out" her passe party dress at her work. And most assuredly her mind will wander back to the gala times when that frock was worn. There is nothing about it to help her concentrate on her job. But with the donning of a uniform comes the spirit of the



Most of the female operatives at the Ideal Hosiery Mills, Maryville, Tenn., wear standard cotton uniforms, with different colors and combinations for the respective departments. Indian Head goods, colored with Indanthrene dyes, is used in making up the uniforms. The mills buy the uniforms wholesale, turning them over to the girls at cost.

work or profession in which it is used. It is associated only with that work and suggests nothing else.

Until recently a uniform entailed extra expense, but now, when it is the only working garb needed, it spells economy. In fact it has so many advantages over ordinary dress for large working groups that we wonder it is not more generally used.

Uniform is the great "leveler," putting all wearers upon the same equality basis, giving each an equal chance. The timid girls, with garments shabbier than the rest, and the would be aristocrats with too costly clothes, all look alike in uniforms. When so clothed the personality of the individual is more pronounced, and she is known for what she really is.

As the morale of an army is raised by uniform dress so is the morale of any working group improved. With all the advantages offered by uniform dress we cannot find that it was used by girls working in the cotton and knitting mills until last Spring when the white Hoover apron was adopted by the girls of the Holston Mills of Knoxville, Tennessee. (See page 1065, August COTTON.) Not only was it adopted by the girls but they saw to it that every one wore it. The owners and managers of the Holston are delighted with results. Mr. Carter said of it, "It has raised the tone of the whole mill. The girls are interested now in keeping the mill clean, for they in their white clothes do not want to sit in dusty chairs. It takes their mind away from fancy clothes." Any manager knows that if a girl wearing a new dress comes into a group of her associates they must all know how that dress is made, where she got it, what it cost, and probably try it on. Remove this diverting interest caused by dress and the girls will be more profitable workers both for themselves and for their employers.

In the mills of the South, and probably of the North as well, where many of the girls wear any old dress they happen to have around, and top it off with a boudoir cap, uniform dress would be of undreamed value. It might even suggest to the wearer that she is not just "a mill hand," but that she is an important factor in the industrial world: that while she may not have the cash or the capacity of her employer yet her services are just as necessary as his. Thousands of girls in thousands of mills aside from all advantages mentioned previously, would be better dressed at less cost if they adopted uniform dress. This is the time of the year to do it, when the old Summer dresses are faded and thin and something a little heavier is needed.

Indian Head linen makes an unexcelled uniform, fast colors (colored with Indanthrene dyes) and its durability commending it. It also has the weight needed for this season of the year.

The Hoover style of construction is the most popular for three reasons: it is attractive in appearance, it is easily slipped on, and its reversible fronts give almost the service of two dresses, thus dividing the laundry bill. In the picture of the three girls, who worked out the uniform idea in the Holston Mills, the dress on the central figure shows the right-hand front, while the dress on her right shows the left front, as evidenced by the lapping of the collars.

Another popular style is the smock, but it is seldom a large group prefers it to the Hoover. One can readily see why the "stouts" would object. But if a department is made up of girls measuring 34, 36 and 38 there is no more attractive style for them. Two of the departments at the

A group of operatives in different departments at the No. 1 Mill of the Knoxville Knitting Mills Company, Knoxville, Tenn. Department spirit and pride is engendered by each department having its special color for the uniforms. As an example, the colors of the six uniforms shown in this photograph, are, from left to right, tan, blue, rose, white, blue, rose, and lavender.

Ashe Hosiery Mill use smocks of pink percale. The attractiveness of this style can be seen in the picture of a group of these girls. The percale, however, did not prove satisfactory, although an 80x80 count, guaranteed boil-proof, was used. The problem now is to find a light weight material, absolutely color fast, for these smocks, as the Indian Head is a little heavy for that style of construction. Peter Pan is splendid but too expensive—except possibly for the girls in the office.

In several mills about Knoxville, Tennessee, different

This group of knitters at the Ashe Hosiery Mills, Knoxville, are shown wearing the pink smocks, this color being that of the knitting department. These are typical mill girls. Puzzle: Find the pale, anemic, sickly "cheeild" the reformers talk about!

departments use different colors for their uniforms. At Brookside, for instance, instead of a drab picture of faded summer dresses there is a joyous blending of bright yellows, apricots, blues, corals, greens, tans and lavenders. Surely these cheerful colors must have a happy effect upon the whole mill force. By the use of different colors such a department pride and spirit is developed that the girls who did not at first want uniforms are soon persuaded to wear them. In some of the departments in the Standard Mills at Knoxville the inspectors and overseers wear white uniforms with collars the color of the girls' uniforms. The advantage of this plan can be readily seen.

As implied, many of the mills do not make the wearing of a uniform compulsory, although they are most anxious for it. They feel the girls must be made to want it and not made to wear it. In accordance with this thought the manager or forelady of each department is sold on the idea of a uniform—she presents it to her girls and either chooses a committee or has them choose one to work with like committees from other departments. These together work out a color scheme for the whole mill. When the choosing of colors is left to all the girls it is almost impossible to get them to agree, for some "just won't wear rose," "look like a black woman in lavender," and "never did like blue." But when the color is already decided by their committee all dissention is of no avail. The fact is that the long white collar brings the color so far from the face that no color is particularly unbecoming to anyone. Uniform white stockings and white head bands may or may not be worn.

Usually not more than a third of the girls want a uniform when the first order is sent—but when that order is filled and they see how pleasing and satisfactory the uniforms are, a second third will order, and the rest will fall into line a few at a time.

After enough girls have decided they want the uniform the manager of the mill appoints some one in each department to measure the girls and take their orders. He then buys at wholesale rates, giving the girls the uniform at the same price, plus transportation charges. Each mill works out some plan whereby payment can be made in three or four weekly installments—some taking the proper amount out of the weekly payroll, others holding the head of each department responsible for collecting it from the girls each week. One girl recently remarked that her uniform seemed like a gift since a little was taken from the payroll each week and she hardly missed it.

The uniforms are made in all the standard sizes; each size being made in three lengths—short, 39 inches; medium, 42 inches; tall, 45 inches. A four inch hem allows for any extra length needed. Sizes above 44 or longer than 45 cost the regular price plus the extra material used.

The average number ordered is three—a few ordering only two, many ordering four and some as many as six. If white is used one is needed for each day. The initial cost may seem a little large to some girls but four uniforms of Indian Head will probably last a year even if worn every day. Long sleeves or short may be used. the former costing ten cents above regular price.

If the girls knew how much better they would look in uniform they would not be contented until they had them. A professor of sociology in a southern college, after visiting a mill where only two departments had uniforms, remarked, "I notice it is the better class of girls who wear the uniform." But that is not true. The fact is the girls who wear them *look better.*

It is an interesting fact that the failure of some cotton crops in the spring of 1921 is making this low priced uniform—without the middleman's profit—available for the mill girls today. That Spring ten different girls studying in Maryville College, Maryville, Tennessee, told their home economics teacher they could not return to college in the Fall because their Dad's cotton crop had failed, and they could not find work to pay their board. She told them she would find work before school opened in the Fall. When nothing could be found a tiny factory—The College Maid Shop—was started. Here these ten girls, plus 103 more who were not expected, earned part or all of their college expenses. Each year more girls have been accommodated until last year 293 girls earned from a small amount needed for clothes to enough to pay all their living and college bills. Their output—crepe pajamas embroidered in wool—is sold in the cities by one store in each city only. With no salesman it has sometimes been a problem to secure market enough; but when a store buys once, their reorders are assured for their customers enjoy buying and wearing a garment which not only gives good value but which has been made by some girl earning her way through college.

When the Holston Mill was considering uniforms for their girls last Spring, they wrote The College Maid Shop for samples. Nothing suitable was on hand but the idea of uniforms for the mill girls of the South registered. Why shouldn't these College Maids make something which would help another group of girls? They themselves were born stretching a dime to do the work of a dollar, and if while earning their college education they can help other girls in like circumstances stretch their dimes they will be most happy. This Summer uniforms have been made by College Maids for mills mentioned and pictured here, and orders are on hand for hundreds more. If the idea of a uniform is as attractive to mills elsewhere as it is to those around Knoxville, the making of them will provide work enough to make a college education possible for every girl who has the courage to work for it. So while the Mill Girls keep the College Maids in college the College Maids will keep the Mill Girls in clothes and all will be benefitted and happy in this cooperation.

U. S. Bobbin & Shuttle Company Now Selling All-Steel Beam Heads.

Announcement has recently been made that the U S Bobbin & Shuttle Company of Providence, R. I., widely known factors in the textile field, are now selling agents for the Apco Mossberg Corporation, makers of All-Steel loom beam heads, All-Steel section beam heads, All-Steel adjustable beam heads, and All-Steel beams.

Announcement.

Announcement has recently been made by the Philadelphia Quartz Company, 121 South 3rd Street, Philadelphia, Pa., advising that as they desire to retain their former position in the Chicago market with the least amount of unfavorable effect on the industry, they have arranged for the outright purchase of that portion of the business of the Central Commercial Company of Chicago which is devoted to the production and sale of Silicates of Soda.

Well Kept Machinery and Efficient Operation

BY OLIVER G. MURPHY

SUPERINTENDENT, SHAWMUT MILL DIVISION, WEST POINT MANUFACTURING COMPANY.

This subject is one that is vital to everyone responsible for the successful operation of a plant. To the mill men of the Southern Textile Association, there is no subject that should have more attention, for to us has been entrusted by the stockholders, directors and general managers, the duty of keeping the properties in such shape as to produce economically in quantities a product that will hold customers and bring new ones to our doors. Such being the case, we shall speak plainly, not picking our words with care, for there is no midway ground when man is faced with a duty.

We are all men of experience, or should be, to hold the positions we do with our respective companies. Some time back I heard a gentleman define experience as "superior intelligence." This superior intelligence is sometimes purchased at terrible cost to ourselves, and sometimes to those who have placed their confidence in our hands. Being men of superior intelligence that has been purchased at a price, I know you have strong opinions on this vital question, and you may feel inclined to take issue with me. If you do, rest assured that I feel this is your privilege, for I am exercising mine in giving to you some frank opinions, after spending all of my work-a-day life in the mill, having filled nearly every job and position from sweeper to superintendent.

A foreman should discharge any second hand, a superintendent any foreman, a general manager any superintendent who does not do everything in his power to keep his machinery in first-class condition. The directors should get a new general manager if he does not back his men up in their effort to keep the machinery in shape to get every possible pound out of it, with the quality the best. But suppose the company has not and cannot get the necessary funds, then leave the sinking ship unless you are responsible for the condition. If so, go down with it and be sport enough to stay down, so as not to sink another.

Any man who has had sufficient experience to reach a position of responsibility and has not gained a superior intelligence is either mentally disarranged, or mentally or physically lazy. In either of these cases, he has no business being allowed a position of responsibility, and any man holding him in such is guilty before his superior officers and untrue to his trust. No man of superior intelligence is going to allow his department or plant to run down on him.

Every now and then you hear someone place a limit to the life of cotton mill machinery. There is almost no limit, if it is kept in perfect repair, except in the case where a new model will either produce better quality or reduce cost. Then the quicker you get the old machine to the junk pile, the better it is for your stockholders.

Someone has said that "red tape is efficiency gone to seed." This is true, but we do want an efficient system for keeping tab on our machinery—a system of inspection by someone who knows, and has the courage to speak the truth to the proper authorities. It is here that we must not lose our bearings and become extravagant or wasteful. Here we will need superior intelligence.

There are three questions that should be asked and answered before a purchase is made: First, do I need it? Second, have I the money? Third, will I get interest on the investment? Any machine that will get desired results and will pay for itself in five years is a safe purchase. We doubt seriously your general manager saying no, if you can answer these questions with a yes.

Gentlemen, we should never spend money on a guess. We must know, and if we do not know, then hold our peace until we do. The speaker believes that we should keep abreast with the times, allowing nothing that will improve our plant or product to get by us, but he is absolutely opposed to being the first fish to bite. We can gamble with our money or be wasteful, but with that which

Oliver G. Murphy.

is entrusted to us, honor compels caution. We should remember when spending, what the cold-blooded Englishman said to the young man, "Son, there is no sentiment in business." I thing that is a rotten motto for life, but when spending that which is entrusted to us, it is well to remember.

Has it ever struck you that for you to operate efficiently, you yourself must be efficient as a foreman? That your personal machine must be well kept? That your mind must be clear? That a clear mind with good judgment does not go with that Monday morning brown taste, the nervous hand and the head that aches more or less? The same thing applies to superintendents, but in addition, they must be well-rounded business men, for their problems are many besides purely technical.

I know a mill where there is a book kept in the superintendent's office, known as The Detailed Machinery Book. A page is devoted to each machine. Once each month the second hand of each department turns in a written report through his foreman that each machine has been examined and is in good condition. Any machine that is not, is not reported until it is. The report is recorded. In ad-

* An address delivered in Birmingham, Ala., on October 28th, 1927, before the Southern Textile Association.

dition to this report, there is one man who inspects each machine more thoroughly, no time limit being set when he is to get around. He is responsible only to the assistant superintendent and superintendent. A copy of his report is left on the desk of the interested foreman. Any machine not found in perfect repair is re-inspected ten days later, and if found still in need, that is when thunder rumbles from the office and lightning begins to flash.

In using the word "supplies," I am using it in its fullest sense, as that or those things needed to keep a machine operating efficiently. To keep from wastefulness on the part of section men, and to bring into play that characteristic which is common to all of us—the love of competition—one mill runs a section man contest, rewarding the men liberally for economy. A standard is given each, based on past expenses, both for machine shop labor and all material used on his section. Each year a first and second cash prize is given in each department, and in addition, a gold medal is given to the man having the best record for the entire mill.

A very successful southern mill agent has said that section men contests of this nature are unwise. In this, the superintendent of this mill agrees, if no check is kept, but in this case, no section that is not personally inspected and approved by the foreman is allowed any reward, the reward going to the next in line if his section is approved. This mill has been running this contest for years, and the results are very pleasing.

A budget system on supplies is in effect at this mill, a system that is rather unusual. Each foreman is furnished with a card which carries at the top the daily amount of supplies that can be used. This figure is only stated in total dollars that have been proportioned to the department. The card is good for thirty days, each day showing the amount spent, and whether it is over or under. This matter is handled daily by the superintendent with the foreman, and here also the results are gratifying. Every day, each man knows just how he stands in relation to his budget. You cannot handle things of this nature intelligently long after the water has gone over the dam. If the foreman is a man of superior intelligence, he will handle his supplies in such a manner as to stay inside of the budget, if he knows just how he stands at all times. Any superintendent that will set his budget so low that his men cannot keep their machines in good running order is a true biblical fool, which is a very unwise man.

We wish to state that a well-equipped machine shop and a high-grade master mechanic are worth their weight in gold to any cotton mill. Blessed is the man that has these jewels. We know a plan worked out by a master mechanic, with the cooperation of the foreman, that has given valuable information and results. Every repair job was given a number and record kept of labor and material necessary to repair or replace. After a year the peaks began to appear, and thus an intelligent fight was made to reduce these peaks. This same master mechanic has in his shop a scrap iron box which is divided into compartments, one for each department. On a certain day in the week and on a certain hour, the foreman with either the assistant superintendent or the superintendent meet around this box. (Let us say here, if you want a thing done, have a set time to do it.) From this box not a thing is allowed to go to the junk pile without the foreman knowing that its day of usefulness is passed.

No machine will produce efficiently and economically first-class finished product unless oiled. Every mill should have an oil chart showing what oil to use, when to use it, and where to use it. This chart should be in the hands of second hands, foremen and superintendent, and should be religiously carried out.

It is astonishing how few men know how much oil to use. We have never been in a mill where the waste of oil was not so great as to be almost a crime. But the most astonishing thing in a mill is the blind faith that some section men and oilers have in getting to the bearings where the oil holes are stopped up and the cast iron is not porous. I challenge any man present, if you have a strong heart, to go to your machine shop and scrap iron pile and watch the things come down. Don't do it, fellows, if your heart can't stand excitement or if your pastor is paying you a visit, for you will either drop dead or be classed with heathens.

Do not get me wrong, for there is no superintendent that appreciates his section men more than I do, but I sometimes feel that a section man thinks that the only thing a wrench is made to do is take off either a worn or broken part, replacing it with a new one; that it is against the law of the land to clean out an oil hole.

When our weave room foreman decided to have me learn to fix heavy duck looms, he placed me with one of the best loom fixers in the shop. Believe me or not, I came near never learning to fix, for every time a warp dropped out, right under that loom he sent me to tighten every bolt and clean out every oil hole. Then I would sit down on the bench and let her run.

When I walk through our shop today, after noticing the small amount of supplies John Doe is using, and see him sitting on his bench and his looms running, our hearts warm to him, and I wish we had something good to offer and believe me, he get it after a while. This foreman of my youth is one of our foremen today, and the faith we have in his judgment is a thing of beauty to see, for he knew how to take care of his machinery, and the kind of men to put his learners with to make the kind of workman he knew he needed.

It is useless for me to tell this gathering that one can produce efficiently unless his machinery is in good physical condition to stand speed, all the speed that is wise, and produce a quality of product that the trade will accept. When we speak of speed we are not thinking of speeding card room machinery. We can think of hardly anything more suicidal. Whip the spinning and the weaving all that your judgment will permit, but do not try any hurry-up tactics on that card room machinery. Just stay in there and fight 'em by keeping the belts on the tight pulleys and every end running. A moment ago I said, "that your judgment will permit." Remember, gentlemen, there is a limit to speed, for you do not wish to shorten the life of your machinery with vibration and breakage that will run your supplies and machine stoppage to an unprofitable point.

Speaking of speed brings us to belts. If, in the day of judgment, men were judged for the brutal way they treat belts, I somtimes think the country of fire and brimstone would have a very large population from cotton mills. If we were "cussing" men, which we are not, we would say it was a "damn shame" that so many bulls die in vain to furnish us with a belt that will last as long as it should, and give the service in traction that one has the right to expect. In our own plant I almost have apoplexy at some

of the things I sometimes see.

Why in the name of common sense don't we wake up to the loss in production at the unnecessary expense of ruining belts? Of all ordinary supplies, belting is perhaps the most expensive. Why don't we take more care in getting the proper size for every drive? Why don't we give slippage constant attention? Don't we all know that these things are absolutely necessary to the successful operation of a plant? "Yes," you say, "you are correct." Then, why, why don't we do these things?

Robert Burnett says "It is not possible to transmit power without loss by means of belt and pulleys." The practical objective then is to prevent unnecessary losses, and to hold to the irreducible minimum such losses as cannot be prevented. He goes on to say that "in belting we have losses from creepage, slippage, centrifugal force and windage." Creepage is an unavoidable loss, plain slippage can in a great measure be reduced, slippage from centrifugal force can be helped in the proper selection of belt, and windage is a power loss by trapping air under the belt as it rides onto the pulley. The last two forces are only apparent in high speed belts.

In our own plant recently, we have begun a study of belts, as to the amount of slippage of different types of belting, of different drives at different loads. Also a study of that great evil, belt dressings; everybody makes the best in the world, you know. We are just curious to know who does.

It might not be amiss to ask you to check thoroughly the difference in the power bill between electrical group drive and direct. I am wondering, from what I know, if the industry isn't doing a little guess work in going so much towards the direct drive? There may be some few places where it may be best, but I question it very much. The Jones' are doing it, you know, and we want to do like the Jones'. Just do a little investigating before spending the money, and drop me a line if I am wrong in my surmise.

It is an age of standardization, and it is pleasing to know that there is an agitation among the belt makers to standardize on width and weight, with the idea of decreasing cost and improving deliveries. If the decrease in cost will only be passed along to our mills, I am sure that the Southern Textile Association mill members will gladly go on record as in favor of standardization.

No mill can operate at the proper efficiency if sufficient supplies are not kept on hand at all times, but here great caution must be used. It has been stated that one billion dollars per year is lost on too large inventories. It is common knowledge that we have business cycles, but it is not so generally known that a study made of commodity prices for many years back shows a recurring cycle which repeats every fifty to sixty years. The last peak came in 1920, after thirty years of decline, followed by twenty years of gradual rise. Today we are slowly, very slowly, going down again. This decline, according to past performances, is not due to stop until 1950. With the facts of this history before us, we should be very, very careful about enlarging our supply inventories, even though we are so foolish as to forget the interest lost on money tied up unnecessarily. We say unnecessarily for we can get wonderful deliveries on almost every supply we need. A nickel saved is a nickel made in this time of tight competition and small profit margin. I do not look for very great reduction in the wage scale any time soon, so the mills are faced with the problem of decreasing cost by efficient operation. It is possible that our fight will be even harder if the nations that owe us pay in trade, which we may as well expect, for they are short of gold.

Looking into the future brings to mind another phase of well kept machinery and its relation to efficient operation, and that is the personnel of our southern mills in the future. Many of us fall down in not properly training our section men. They are really your key men when it comes to well kept machinery. If they did their work intelligently and well, a multitude of evils would disappear. With the rate at which demands are coming upon us, the time is fast approaching when we are going to need a higher grade section man than we have had in the past. The answer is in the mill schools of the South. They are today turning out boys with the fundamentals of education that will lift the grade of workmen far above those of former years, if we can offer them a wage sufficient.

We must be more efficient, we must produce more per unit or the trade will forever lose this, its greatest asset of the future. We are proud of our mill men of the South. In the last ten years they have done nobly; but, gentlemen, the possibilities of improvement in the trade opened to thinking men, if accomplished, will make the story of Aladdin's lamp a forgotten tale.

You and I, fellows, will some day "like the Arabs fold our tents and silently slip away," and the worries of drafts, twist, speeds, efficiency and such like will only be a memory that will drift past as we day-dream "beside the river, as we rest beneath the shade of the trees." But while we are here, let us give all we have.

Do you love the old mill? Every spinning frame, every loom, yes, every bolt in it? Do you appreciate the people that work for you? The people for whom you work? Your selling house and those to whom your product goes? If you do, you're right, boys, you're right; so stay in there and fight, and remember that eternal vigilance is the price of success.

Receivers for Wickwire Spencer.

The Wickwire Spencer Steel Company, Inc., voluntarily went into receivership on October 22nd, and Edward C. Bowers and Charles L. Feldman were appointed receivers by the court. Mr. Bowers has been president of the corporation for the past two years, and his appointment as active director of affairs will insure the retention of the present organization, administrative, operative and selling, it is announced. All plants will be operated as heretofore without shutdown. Any unfilled commitments and future business will be handled. There will be no rearrangement of the selling organization. The American Wire Fabrics Corporation, while it is a subsidiary of Wickwire Spencer Steel Co., Inc., is not in the receivership and is in no way affected by these proceedings, it is stated.

Timken Acquires British Company.

The Timken Roller Bearing Company, Canton, Ohio, and M. B. U. Dewar, London, England, have purchased from Vickers, Limited, all of the capital stock of British Timken, Limited, which gives Timken complete control, throughout the world, of the manufacture and sale of Timken bearings. Mr. Dewar has assumed active management of British Timken affairs. The plant at Birmingham, England, is being enlarged, and it is understood factories will be established in France and Germany.

Regulating Weights from Moisture Regain

BY W. A. L. SIBLEY.
SUPERINTENDENT, WHITNEY MANUFACTURING COMPANY.

First, let me clarify the title just a little by saying that it is keeping the weights of the cotton on standard at each operation, by allowing for the moisture present in one place, and eliminating it in another. The two places to which I refer, are, first, the picker room, and second, the roving on drawing and speeders.

At this point I think it might be well for me to add that in neither place is the idea original with us, for there are a great many mills correcting laps for moisture in the picker room, and a few I know of who are using the "bone-dry" method for sizing roving; and no doubt, many of them are getting better results than we are. But there are certain phases that we had to work out for ourselves, and I trust that you will find the information we have to give you beneficial.

Correcting Finisher Picker Laps for Moisture.

In mills where the windows in the picker room can be kept closed and all the air for the fans drawn from the card room, where the air is conditioned to a relative humidity of 45 per cent to 50 per cent it is a rather simple matter to correct the weight of the laps for moisture. But when all the air must be drawn from the outside, where today it may be dry—say around 30 per cent relative humidity—and tomorrow raining, with a relative humidity of 80 per cent, the job of correcting for moisture takes on a different aspect; and we found the difficulty to be as follows:

When the relative humidity is below 45 per cent, the cotton in the finisher picker lap has more moisture than the "standard table of regain" allows for, but when the relative humidity gets above 55 per cent, the cotton does not take up as much moisture as the regain table calls for. Now, I do not want you to think I am criticizing the humidifier people and others who have worked out these tables, nor that I am taking issue with them as to their figures. However, as I understand it, in establishing the figures for regain, the cotton was subjected to the different percentages of relative humidity for many hours prior

*A paper presented at the Birmingham meeting of the Southern Textile Association.

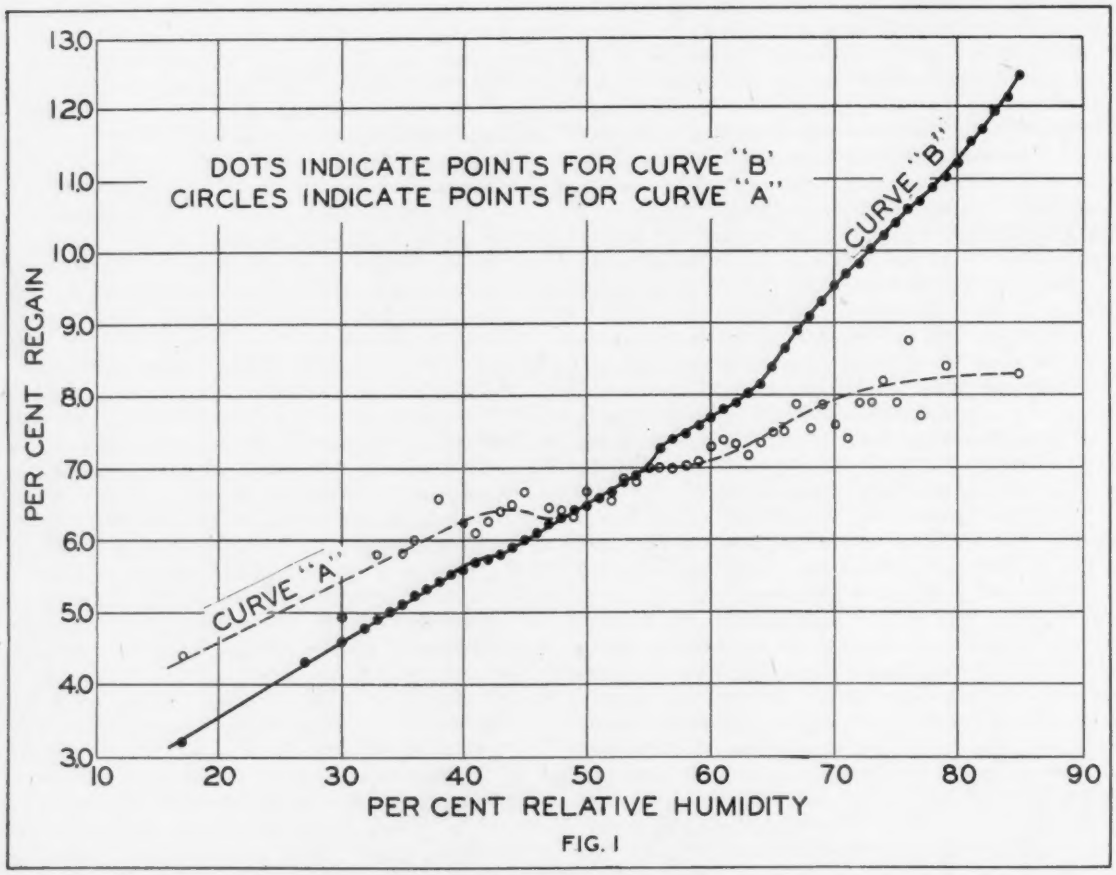


FIG. 1

This chart shows the curve A plotted by taking the relative humidity in the picker room and drying out a piece of lap to determine the actual moisture content at that point, and the curve B, which is taken from the standard table of regain. The difference is explained in the accompanying article. The actual regain under mill conditions is higher than that given in the table, up to about 50 per cent relative humidity, above which point the actual moisture content found was lower than that allowed for in the standard table. From this chart, the author established the regain figures shown in the table in Fig. 2, by which the lap weights are changed.

Wet Bulb Temperatures	Dry Bulb Temperatures 65	66	67	68	69	70	71	72	73	74	75	76	77	Begain Curve "B"	Begain Curve "A"	Weight of Laps (including 2¾ lbs. for lap stick)	Relative Humidity	Dry Bulb Temperatures 78	79	80	81	82	83	84	85	86	87	88	89	90
	61½	63½	64½	65	65½	66½	67½	68½	69½	70½	71½	72½	73½	12¼			85	74½	75½	76½	77	78	79	80	80½	81	82	83	84	85
	61½	63	64	64½	65½	66½	67½	68	69½	70	71	72	73	12			83	74	75	76	76½	77	78	79	80	81	82	83	84	85
	61	62	63½	64	65	66	67	68	69	70	71	72	73	11¾			82	74	75	76	76	77	78	79	80	80½	81½	82½	83½	84½
	61	62	63	64	65	66	66½	67½	69	69½	70½	71½	72½	11½			80	73½	74½	75	76	76½	77½	78½	79½	80½	81½	82½	83½	84½
	61	61½	63	63½	64½	65½	66½	67	68	69	70	71	72	11¼	8%	43½	79	73	74	75	75½	76½	77½	78	79	80	81	82	83	84
	60½	61½	62½	63½	64½	65	66	67	68	69	70	71	72	11			78	73	74	74½	75	76	77	78	78½	80	81	82	83	84
	60½	61	62	63	64	65	65½	66½	67½	68½	69½	70½	71½	10¾			76	72½	73½	74	75	76	77	77½	78½	79½	80½	81½	82½	83½
	60	61	62	63	64	64½	65½	66½	67	68	69	70	71	10½			75	72	73	74	74½	75½	76½	77½	78	79	80½	81½	82½	83
	60	60½	61½	62	63	64	65	66	67	68	69	70	71	10¼			74	72	72½	73½	74½	75	76	77	78	79	80	81	82	83
	59½	60	61	62	63	64	65	66	66½	67½	68½	69½	70	10			73	71	72	73	74	75	76	77	77½	78½	80	80	81	82
	59	60	61	61½	62½	63½	64½	65½	66	67	68	69	70	9¾			72	71	72	73	74	74½	75½	76½	77	78	79	80	81	82
	59	59½	60½	61½	62	63	64	65	66	67	68	68½	70	9½	7½%	43¼	70	70½	71½	72	73½	74	75	76	77	78	79	79½	80	81
	58	59	60	61	62	63	63½	64½	65½	66½	67	68	69	9¼			68	70	71	72	73	74	75	76	76½	77½	78½	79	80	81
	58	59	60	61	61½	62	63	64	65	66	67	68	69	9			66	70	71	71½	72½	73½	74	75	76	77	78	79	79½	80
	57½	58½	59½	60½	61	62	63	64	65	65½	66½	67½	68½	8¾			65	69½	70	71	72	73	74	75	75½	76½	78	78½	79	80
	57	58	59	60	61	61½	62½	63½	64	65	66	67	68	8½			64	69	70	71	71½	72½	73½	74	75	76	77	78	78½	79
	56½	57½	59	60	60½	61½	62	63	64	65	66	67	67½	8¼			63	68½	69½	70½	71	72	73	74	74½	75½	77	78	78½	79
	56	57	58½	59	60	61	62	62½	63½	64½	65	66	67	8	7%	43	62	68	69	70	71	71½	72½	73½	74	75	76	77	78	78½
	56	56½	58	59	59½	60½	61½	62	63	64	65	66	66½	7¾			60	67½	68½	69½	70	71	72	73	73½	74½	76	77	78	78½
	55½	56½	57½	58½	59	60	61	62	62½	63½	64½	65	66	7½			57	67	68	69	70	70½	71½	72	73	74	75	76	77	77½
	55	56	57	58	58½	59½	60½	61½	62	63	64	64½	65½	7¼			54	66½	67	68	69	70	71	71½	72½	73	75	76	76½	77
	55	56	56½	57½	58	59	60	60½	61½	62	63	64	65	7	6½%	42¾	51	66	66½	67½	68½	69½	70	71	72	72½	74	75	76	76½
	54½	55½	56	57	57½	58½	59½	60	61	62	62½	63½	64½	6¾			50	65	66	67	68	69	69½	70½	71	72	73	74	75	76
	54	55	55½	56½	57	58	59	59½	60½	61½	62	63	64	6½			48	64½	65½	66½	67	68	69	70	70½	71½	73	74	74½	75
	54	55	55	56	56½	57½	58	59	60	60½	61½	62	63	6¼			47	64	65	66	66½	67½	68	69	70	70½	72	72½	73	74
	53	54	54½	55	56	56½	57½	58½	59	60	61	61½	62½	6			44	63	64	65	65½	66½	67	68	69	70	71	72½	73	74
	52½	53½	53½	54½	55	56	56½	57½	58½	59	60	60½	61½	5¾	6%	42½	41	62	63	64	65	65½	66½	67	68	68½	70	71	72	73
	51½	53	53	53½	54½	55	56	57	57½	58½	59	60	61	5½			38	61½	62	63	64	65	65	66½	67	68	69	69½	70	71
	51	52	52	53	53	54½	55	56	56½	57½	58½	59	60	5¼			35	60½	61½	62	63	63½	64½	65½	66	67	68	68½	69	70
	50	51	51	52	52½	53½	54	55	55½	56½	57	58	59	5	5½%	42¼	32	59½	60	62	61½	62½	63	64	64½	65½	67	67½	68	69
	49	50	50	51	51½	52½	53	54	54½	55	56	56½	57½	4¾			28	58	59	60	60½	62	62	63	63½	64½	66	66½	67	68
	48	49	49½	50	51	51½	52½	53	53½	54½	55	56	56½	4½			25	57½	58½	59	60	60½	61	62	62½	63	65	65½	66	66
	47	48	48½	49½	50	51	51½	52	53	53½	54½	55½	56½	4¼	5%	42	24	57½	58	58½	59	59½	60	61	62	62	64	65	66	66
	46½	47½	48	48½	49	50	51	51½	52	53	53½	54½	55	4			20	56	57½	57	58	58½	59	60	60½	61	63	64	65	65
	46	47	47½	48	48½	49½	50	51	51½	52	53	53½	54½	3¾			18	55	56	56½	57	57½	58	59	60	60	62	63	64	64
	45	46	46½	47½	48	48½	49½	50	50½	51½	52	53	53½	3½	4½%	41¾	16	54	55	55½	56	57	57½	58	59	59	61	62	63	63
	44½	45	46	46½	47	48	48½	49	50	50½	51½	52	53	3¼			15	53½	54	55	55½	56	56½	57½	58	58	60	61	62	62½

Fig. 2. This table is used for changing the weight of the laps. The dry bulb temperatures are the horizontal figures shown at the top of the table. The wet bulb temperatures run vertically, as shown. The second hand takes a humidity reading with a sling psychrometer, and, finding the dry bulb temperature on the chart that corresponds to the reading, and then looking under it until the correct wet bulb temperature is reached, the proper weight of lap to use is found on the same line in the middle of the chart. The second hand then sets the indicator on the lap scale, see Fig. 3, and the lap man is governed by this.

to being dried out and weighed; while on the other hand, under actual mill conditions the cotton is subjected to the air only for a very short space of time, as it passes over the screen.

After establishing that this condition existed, it was first necessary for us to determine just how much this difference was. So, for three months we took a humidity reading in the picker room twice a day with a sling psychrometer; at the same time we took a piece of cotton out of a lap that had just been run, dried the cotton out in an electric oven, and determined how much moisture was actually present. By means of this procedure, for the three months' period, we had actual tests for practically every degree of relative humidity from 20 to 85 per cent.

With this information, using "Per Cent Relative Humidity," as abscissas, and the "Per Cent Regain" (as found by the test, to correspond with each per cent relative humidity) as ordinates, we were able to plot a curve. (This is illustrated in the chart shown in Fig. 1.) This curve, *A*, represents the actual amount of regain for each relative humidity reading as shown by our tests, as explained.

Now, as will be noted in the illustration, we plotted another curve, *B*, on the same sheet, this time using the per cent regain as shown in a "Standard Regain Table," as ordinates. By observing the two curves, it is seen that *A* at 20 per cent relative humidity is about one per cent regain above *B*, gradually approaching it as the relative humidity increases until at 45 per cent relative humidity they are together and stay together through 55 per cent; then they begin to separate again, but this time it will be noticed that *A* is below *B*, getting farther away as the relative humidity increases. At 85 per cent relative humidity, which, according to the standard regain table calls for about 12¼ per cent, regain, the curve *A* shows that only 8½ per cent regain actually existed.

With this new relation of moisture to cotton, we were able to make a table showing the weight of our laps at every per cent relative humidity (under actual mill conditions) that made a difference of one-half of one per cent in regain, which in case of our weight of lap amounts to about one-quarter of a pound.

The second hand in the card room takes a reading with a sling psychrometer every 2½ hours, and looks at his table (as shown in Fig. 2), to see what his laps should weigh at the relative humidity as found by the psychrometer. When this desired weight is found, he changes the weighing scales accordingly. We have arranged an attachment on the scales, which is shown in Fig. 3, and explained therewith. The second hand simply moves this around the rim of the scales until the center finger is above the weight desired.

Thus it will be seen that in the picker room, we *allow* for moisture, but, as mentioned in the beginning, we *eliminate* the moisture in sizing the roving. Let us now consider the latter.

Sizing Roving by "Bone-Dry" Method.

Twice a day, a yard of sliver is taken from each drawing delivery, all placed in an aluminum wire basket, and kept for two hours in an electric oven at a temperature of between 220 and 230 degrees F. The scales are so arranged and attached to the oven that a weighing can be made without removing the roving from the oven, thereby assuring a "bone-dry" weight.

Once a day we reel off 12 yards from 12 to 20 bobbins of each hank roving on the speeders. These are placed in a basket in the oven and dried out, as described. This does not give an individual weight from each bobbin, but does give the average weight of each hank roving.

Your question probably is, "What has been gained?" The answer is this: Every particle of doubt has been removed as to how much moisture the sizing represents. Without this method, when you size the roving on a dry day and find it light, you immediately decide that probably it has very little moisture in it, so you don't change the draft gears; several days later it is cloudy and the roving goes heavy, and you decide it is moisture present, so again you don't change. In each instance you may be correct; however, at neither time do you know just *how much* of this weight is cotton, and how much is moisture. But with the "bone-dry" method, you don't have to guess, you *know* the weight shown is all cotton, and you can change gears without fear of working in the wrong direction.

Results Obtained.

After all, though, it is results that count, and unless a new method betters our condition, naturally none of us

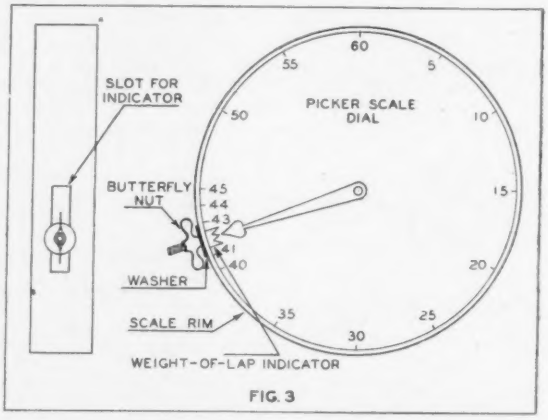


FIG. 3

The weight of lap indicator is attached to the rim of the picker scale as shown, being placed in a slot. There are three points on the indicator. The middle point is placed by the second hand on the desired weight. The width between the two outside points is the distance of one pound on the scale dial, so that it is only necessary for the lap man to keep the scale finger between the two outside points, thus holding the laps to within a half pound variation each way, for whatever desired weight at which the second hand sets the indicator.

wants to change. Consequently, let me enumerate a few of the advantages that we have gained.

By a correction of our laps in the picker room, we do not have to change more than one tooth on the crown gears on the drawing oftener than once a week. We allow the drawing to vary one-half a grain light and one-half a grain heavy before we change a tooth on the crown gear, as one tooth affects the weight that amount.

By making gear changes on our drawing, within the allowance of variations just mentioned, we do not have to change more than one tooth of a crown gear on the speeders—which make as fine as a 3.60-hank roving—oftener than once a week. On the frames which make a 1.90-hank roving we have not changed even a crown gear since August 10th, or in a period of over eleven weeks, and on our speeders a variation of only four points is allowed on each side of standard before a change is made of one tooth on the crown gear.

In the spinning room there hasn't been a gear change made since this method was started some four months ago.

As for cloth weights, the following will give the average of each style for the last three months:

37-inch, 4.00 averaged 3.99, extreme variation, nine points.

40-inch, 3.60 averaged 3.61, with an extreme variation from heavy to light of six points.

36-inch, 4.50 averaged 4.49, extreme variation, eight points.

36-inch, 5.50 averaged 5.49, extreme variation, five points.

In conclusion, it might be well to state for information, that this method is not a panacea for curing all the causes of weight variations, for in reality it cures only one, that being moisture, and this method should only be considered as a necessary supplement, after mechanical causes of variations have been removed.

CLEANING LOW GRADE COTTON

Texas Textile Association Makes This Main Theme of Waco Meeting

BY ROBERT W. PHILIP

Means of improving cleaning methods for handling low-grade cotton featured the discussion of Texas mill men at the semi-annual convention of the Texas Textile Association, held at the Raleigh Hotel, Waco, Texas, on Friday and Saturday, October 21st and 22nd. There was as well a fund of discussion pertaining to other timely mill subjects which made the meeting one of interest not only to the Texas mills but to other plants as well; this being evident from the report of this discussion which will be found in the following paragraphs.

Don D. Towers, agent, Worth Mills, Inc., Fort Worth, Texas, was in charge of the convention as president of the Association. The manner in which he conducted the discussions contributed very largely to the success of the meeting, for, being admirably equipped as a leader, he was able to draw out the different members on the points developed in such a way as to produce the most good from each discussion.

The meeting opened on Friday evening, October 21st, and the visitors were welcomed to Waco by City Manager McAdams, the response being made by J. G. Coman, superintendent, Mexia Textile Mills. It being learned that C. S. Tatum, one of the pioneer leaders of the Association, was confined to a Dallas hospital, the president appointed a committee to prepare and send to him a telegram of regrets from the Association. The next feature was the address of the president, Mr. Towers, who said in part:

"This is the twenty-fifth semi-annual meeting of this association. Since it was organized in 1915 by C. S. Tatum, Dan Poole, George C. May and a few others, many changes have taken place. Very few of you here tonight were in any way responsible for the organization of this group, but you are now responsible for its future.

"A few weeks ago, when the Texas Cotton Manufacturers' Association met in Fort Worth, Mr. Hugh Clarke, Mr. Poole and I invited ourselves to be present, and requested their president, Mr. C. R. Miller, to be allowed a few minutes to address the meeting. After their luncheon was over, Mr. Clarke made a splendid talk, explaining the object of the Texas Textile Association and the good which had been accomplished and what might be expected in the future. He urged that the presidents and managers of the Texas cotton mills give their full support to our Association, and to see that each mill was represented at the meetings. Mr. Poole also made a few very timely remarks on this important matter, assuring the manufacturers' association that the 'howlers' had been eliminated from our ranks, and the work now being done by the Texas Textile Associa-

Don D. Towers, President.

tion was of a serious nature, and would result in great benefit to the mills.

"After four of five members of the manufacturers' association had expressed themselves as being most favorable to the textile association, they voted officially to lend their moral support, and cooperate in any manner that would further the best interests of the Texas cotton mills. It therefore behooves us to realize our responsibility and do our level best to make this a successful meeting."

Continuing, Mr. Towers said: "I wonder if any of you realize what a wonderful age of development we are living in, with respect to cotton manufacturing. The art of spinning and weaving is one of the oldest in the world, dating back for thousands of years. For centuries practically no improvements were made in the crude methods of spinning and weaving, yet in spite of all that, yarns were spun by hand in India, a hundred years ago, so fine that cloth was

woven with 300 threads to the inch. With all our modern machinery, there isn't a mill in Texas can do that today.

"In 1740 the first real improvement was made in the spinning and weaving art. An Englishman, by the name of Kay, invented the fly shuttle loom, and for his pains and ingenuity was mobbed, due to the fact that when the weavers realized that with the use of his new invention, many more yards could be woven per day than by the older methods, they figured, of course, that they would be thrown out of work if the invention came into general use.

"In 1742, the first power driven mill in the world was built in England. Power was generated by two asses walking around a vertical axis, on which was a wooden gear wheel. While this mill was not a success, still it marked the beginning of power application to textile machinery.

"The first successful mill in America was built by William Slater, in the state of Rhode Island, in the year 1793. The machines were built mostly of wood and entirely from memory. Cotton manufacturing had, by this time, become so important in England that the government would not allow any plans or drawings of their machinery to be taken out of the country. William Slater was an English millwright, who thoroughly knew his trade, and on his arrival in America, succeeded in duplicating the English machines entirely from memory.

"How many of you here tonight can even sketch, from memory, and put down the number of teeth of any important line of gearing on any of your machines? How many of you can give the number of teeth in all the gears at the end of a spinning frame? If we fellows really knew and loved our jobs as much as we should to make them a real success, this would not be a very difficult feat.

"Do you realize that since William Slater built his mill, the principles involved in carding, spinning and weaving have really changed very little? However, during recent years great improvement has been made in methods and processes of cotton manufacturing, but after all the years that the art has been in existence, we have not yet succeeded in reducing it to an exact science. I feel that we are on the threshhold of many more important improvements and nearing the goal of reducing cotton manufacturing methods to more nearly an exact science.

"It is for the purpose, first, of adding our mite toward advancing the art of cotton spinning, and, second, of bettering our own mills, which necessarily means bettering our own job, that we hold these Association meetings twice a year. As president of your Association, I ask that all of you enter into the discussion of as many of the questions as possible. Remember that to receive a real benefit from these meetings, we first have to give our best.

"At Fort Worth, the mill managers were told that our meetings are strictly business, that all the 'howling' had been eliminated, and I am sure that when this meeting is over, these words will have proven true, and that each of you can return to your job with a lot of good for your mill and yourself."

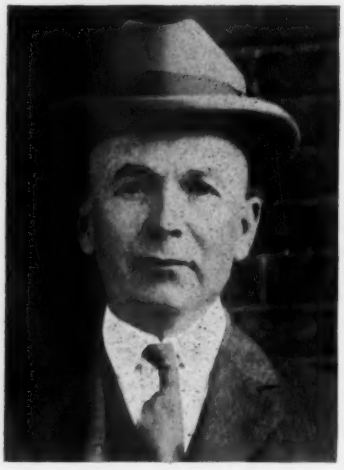
Talk on Human Relationships.

The president next asked Hugh S. Clarke, of the Miller Cotton Mills, Waco, to introduce Bruce Cobb, Waco school superintendent. Mr. Cobb spoke briefly upon the factors of relationships essential between employer and employee, emphasizing the points of fixing responsibility and of maintaining as close a personal relationship as possible.

Following Mr. Cobb's talk, the president turned the meeting into the discussion of the questions which had been sent to the mills in advance of the meeting. Mr. Towers announced that he had not assigned any particular questions to the different mills, but had asked all to discuss as many as came within the range of their work. The first question was, "How can improvements to the ordinary pickers be made to increase the amount of cleaning without damaging the staple?" There was considerable discussion on this, it taking the form of different methods practical for the better cleaning of the lower grades of cotton which are rapidly increasing in use.

Cleaning Low Grade Cotton.

Herbert A. Burow, assistant agent, Postex Cotton Mills, Post, Texas, was the first to respond to this question. "My experience," he said, "has been mostly on the Kitson picker. We worked a great deal along this line when I was at Bonham with Mr. Tatum, in trying to get the pickers to do better work. As most of you know, the pickers we had, which were of the 1900 model, were equipped with grid bars that are practically stationary. We experimented



Dan H. Poole, Secretary-Treasurer.

with them, trying to get some kind of an adjustment so as to give us the proper amount of cleaning, and one of the hardest things we had to put up with was the amount of draft that it took to give us an even lap; it was so much that it would ordinarily drag in most of the motes after they were knocked out.

"We experimented with different drafts, going as low as possible and then to the other extreme, and we never could get the proper draft to keep from taking the stuff back in. We would knock it out at the top and it would come back in at the bottom. We put in some screens and closed up some of the grid bars, but that did not help us very much. Then we tried some movable grid bars, such as you have in some of the vertical openers, and we found that with these we could do more good than with the stationary grid bars."

Mr. Towers said that by experimentation they had secured some surprisingly helpful results at their mill, "although we cannot lay our finger on any one thing we did, but when we got through the results, when compared with what was being accomplished before, we felt were well worthwhile. Our carder, Mr. Purgason, is here, and as he has done most of the work, I am going to ask him to tell you the story in his own words."

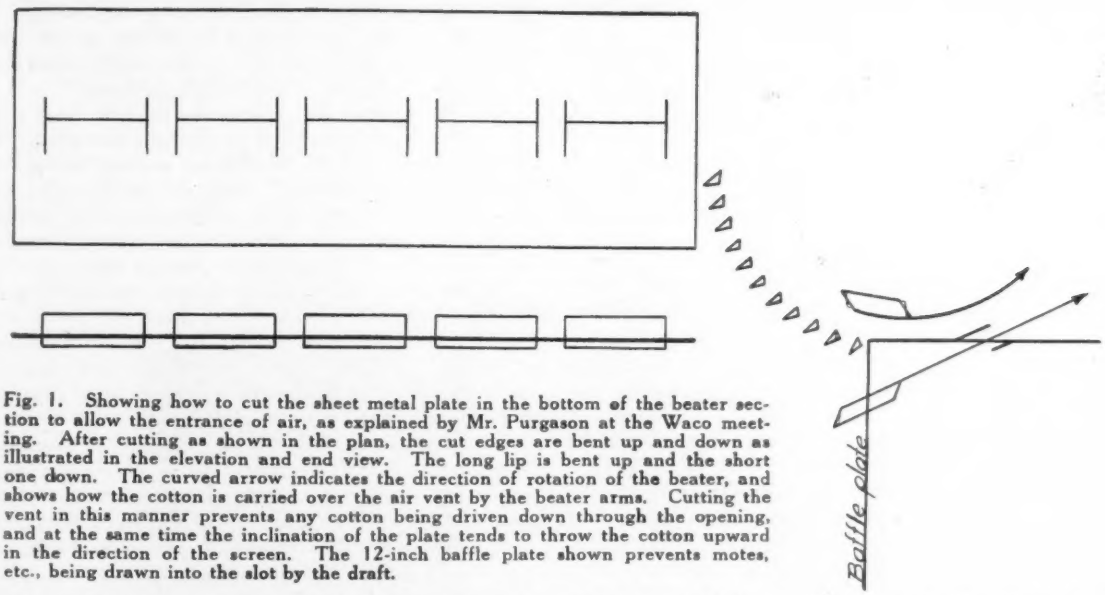


Fig. 1. Showing how to cut the sheet metal plate in the bottom of the beater section to allow the entrance of air, as explained by Mr. Purgason at the Waco meeting. After cutting as shown in the plan, the cut edges are bent up and down as illustrated in the elevation and end view. The long lip is bent up and the short one down. The curved arrow indicates the direction of rotation of the beater, and shows how the cotton is carried over the air vent by the beater arms. Cutting the vent in this manner prevents any cotton being driven down through the opening, and at the same time the inclination of the plate tends to throw the cotton upward in the direction of the screen. The 12-inch baffle plate shown prevents motes, etc., being drawn into the slot by the draft.

In explaining the changes made, Mr. Purgason said, "We have a cleaner equipped with the Buckley type beater, which is the first cleaning machine after the bale breaker and tandem feeder. We went into that and found that part of the bars had got knocked out and were set with the edge too much to the fiber, and that they had a sharp edge on them. We couldn't do very much with that except to set the grid bars almost closed and back off the feed rolls from the beater as far as possible. By doing this we found we got just about as good cleaning without damaging the staple, which seems to happen when the bars are set with too much edge exposed.

"Next, we went to our vertical openers and found that several sections of the bars were not set properly, some of them having the edge of the bar projecting out too far. We found also that buckles coming through had knocked a lot of burrs on the bars, and naturally the bar would stick out further toward the beater and when the cotton was whipped against it, it would cut it, so we took all of the bars out and filed them and dulled the edges, and took emery paper and smoothed the job up. We found that the beater in the vertical opener was too close to the bars, so we raised the beater up just as far as it would go, and we found that we got just as good cleaning; not quite as many heavy motes, but lots of leaf, dirt, etc.

"In the opening room proper we have three openers with 20-inch Buckley beaters, with the old type bars in there that came in the machine, and we also had some new type bars, and we found that with the new type bars we could get the quality of cleaning we wanted by adjusting them with a very slight working edge exposed. The draft was so strong to draw the cotton to the second floor that it would jerk the motes back. We remedied that by taking out a section of the trunk and cutting a slot about three inches wide across the width of the machine, that let in the air in front of the beater; the cotton was thrown out to the hole by the beater and the suction would carry it upstairs. We got about a third more motes of the same quality in this manner.

"Then we went to work on the breakers upstairs, all of which we equipped with cylinder beaters and there we wanted to take out the coarser motes, so we let the old type bars stay in the breakers. But we had so much draft there that the motes coming out were not enough, so to remedy that we used an old idea of making a slotted plate to go directly in the bottom of the beater circle between the dead air space and the grid bars. It is a plate eight inches wide, and this idea was to cut five slots in this plate, with an air space about three inches wide. Below this we put a 12-inch board, an inch thick, to act as a baffle for the motes. (For the sake of clarity, the accompanying sketch, Fig. 1, is used to illustrate this application described by Mr. Purgason. It shows the slotted plate and the manner of cutting, as well as the baffle board mentioned.) By the time the motes, etc., taken out by the grid bars, reached the bottom of the baffle, they would not return up through the slots in the plate. We now have this also on the finishers."

With reference also to breaking strength, in addition to securing the cleaning desired, Mr. Purgason said that, "we went over all the grids and backed them off, and we find that we get just the quality of motes we want by letting the grid bars lie back, and get better strength. The old system was to set the grid bars up rather close to the beater, but find we get more and better motes by backing off just a little, and we also find it has helped our breaking strength. We also backed our beaters off from the feed rolls. These settings have added to our breaking strength and yet we are getting as good cleaning as we want."

"Not only did we get better cleaning and opening," emphasized Mr. Towers, "but we raised our breaking strength about ten per cent by these changes. However, you cannot use that plate with a two-blade beater. You should have the cylinder or Buckley type of beater, of which there are several on the market. We are using it with a certain type of cylinder beater that has become very popular and that has proven very efficient."

Mr. Towers then discussed the use of the new adjustable grid bars and the methods of setting. They are smaller than the former type, and there are more of them, he said. The older method of setting the bars is to put the first bar directly in perpendicular line with the feed rolls. Then, as he explained on the blackboard, when the bars are

opened, the staple is damaged. With the new bars, he said, he sets them so that the second bar is under the feed rolls, allowing the bars to be opened just a little more. On the old bars, he said there is a 1/16-inch edge projecting out, while with the newer ones, there is just a small edge projecting to offer resistance to the stock, when properly set.

Hugh S. Clarke said he had tried a similar proposition. His pickers, he said, have eight bars that are adjustable in four-bar groups. He has found that by dropping the top four bars back, and closing the lower four, he secures the best results.

It was brought out here that in connection with the slotted plate described by Mr. Purgason, the 12-inch baffle plate is absolutely essential to prevent the motes from coming back into the work.

Ingram Lee, assistant superintendent, Dallas Textile Mills division, C. R. Miller Mfg. Co., Dallas, was the next speaker. "About a year ago," he said, "we thought of something that might bear on this discussion. When our pickers were set up the fan speed for some reason was made about the same as the beater speed. It was a long time before we found out what the trouble was. A good many of our heavier motes were going on through with our cotton. The beater speed was so high that the heavy motes were being carried over. We found that by speeding up the fan about 200 revolutions we overcame that."

"You must have certain a minimum fan speed sufficient to snap the stock up against the screen," agreed Chairman Towers, "at the same time an excessive fan speed will give you trouble. By using the arrangement we have described, and the baffle, you can get a satisfactory fan speed to make a good, hard compact lap.

"In connection with these changes", he continued, "we reduced our beater speeds quite materially so they are running slower, perhaps, than most of you run yours, and yet we are making a lap in the same length of time as before. We cut the speed of the beater and increased the feed pulley, cutting the strokes of the beater per inch, and with all things done and taken into consideration, we were just surprised at the results that were secured."

"What are your fan and beater speeds?", asked Mr. Burow.

"We have a fan speed of 820 r.p.m.," replied Mr. Towers. "Our three-blade carding beaters are going 850 r.p.m., and the 16-inch cylinder beaters, 750 r.p.m.

Mr. Coman was called upon to tell of any work he had done. "We have not done anything recently," he responded, "but some time ago we slowed down our beater speed and increased the production pulley and in that way got the same number of laps—in fact we increased the number of laps. Our beater speed is around 900 r.p.m., and the fan speed is about the same, and we are getting fairly uniform work."

Mr. Towers asked Mr. Burow how he figured the beats per inch. The reply was, from the circumference of the feed roll and the revolutions of the same, taken over a period of several minutes to get an average. In connection with beats per inch, Mr. Towers declared that by reducing his from 58 to 50 on a three-blade beater, he made a considerable difference in the appearance of his laps.

"Did you change your setting from the beater to the feed roll?" C. B. Brady, of Sherman, asked Mr. Towers in connection with the improvements he had made at Fort Worth.

"On the cylinder beater, we kept that pretty far out," said Mr. Towers. On the openers downstairs, on the 20-inch opener, we brought that out to 3/8 inch between the edge of the beater and the feed roll. On the breaker picker we brought that out to 1/4-inch, and on the carding beater we get that up pretty close, approximately 1/16 inch."

Mr. Burow asked Mr. Towers for his total beats per inch. "On the breaker picker," replied the president, "10 strokes to the inch; on the finisher carding beater, 52 strokes to the inch; on the O7 opener downstairs, on the 20-inch machine, it will run in the neighborhood of 8 strokes. The lower you can get the beats per inch, within reasonable limits, the better breaking strength you will get."

At this point, W. F. Smith brought up the question, "Which is better, the vertical opener single or in tandem?", and the chairman called upon Dan H. Poole for discussion of this in view of some experiments he had been conducting at the Sherman Mfg. Company, where he is superintendent.

"We are playing with almost everything at Sherman, more or less all the time, "said Mr. Poole. "This past summer we experimented with our vertical openers but before that we had installed a tandem feeder and lattice cleaner. In experimenting around we found that we got just as good results by cutting out both of our vertical openers, and we have been running that way. However, we are going to hook them back up. We have a screen section on the front. Then we will have a bale breaker, tandem feeders, vertical openers with screen section, and lattice cleaners. We found we took out more waste on the pickers with both of the vertical openers cut out."

Mr. Poole's overseer of carding, Mr. Brady, added that they got a slight increase in breaking strength of about three to five pounds when the verticals were removed from the line. He has grid bars in both verticals, instead of perforated screens, he said in response to a question from Mr. Smith.

Mr. Smith described an opening arrangement he had designed, which, after opening the cotton thoroughly, delivered it to a vertical opener with perforated screens, and said this threw out the sand and trash in a surprising way.

"That is what they are supposed to do, "declared the chairman, "in addition to the blooming effect. You can take dull cotton and put it through a modern opener room equipment, with a vertical opener in it, and you will be surprised at the amount of color you have taken out of that cotton. As long as it doesn't do any damage to the cotton I think it will be well worth while."

Mr. Poole added here that in cutting out the vertical opener, "we have eliminated that curl which you have often found in your stock after it passes through the vertical opener."

"You speak of curling; was the cotton taken through the vertical opener by the condenser or a screen section?" inquired the chairman.

"It was pulled through by the fan in the mill," answered Mr. Poole.

"Well," said the chairman, "if you would change that and put in a cage or screen section on the vertical so that you can pull it through the opener with just a minimum amount of draft, with the speeds in the machine right, you can eliminate that curl, still using the vertical opener."

"That is exactly what we are planning to do", said Mr. Poole.

"Mr. Towers is absolutely right," said Hugh Clarke. "If you will close up the grid bars right, cut the speed of

the vertical shaft down to 750 r.p.m., raise the vertical shaft and cut the draft down to where it will barely take the cotton through, it positively will not curl the cotton in the vertical opener."

"That is right," said Mr. Towers, "It will not do it."

Mr. Brady brought up the point that on exactly the same cotton, on a 10 x 5 fly frame bobbin, the bobbin would have a tendency to be soft, and when the cotton cleaned after the verticals were removed reached the fly frames, the bobbins began to get firm. Mr. Burow offered the possible explanation that the vertical probably was making the cotton fluffier. Mr. Towers thought that going through the drawing frame trumpets would compress it again, but made the illustration of holding one end of a strip of paper and scraping it with a knife, producing a curl in the paper; declaring that perhaps the bars were having this effect on the stock, giving it a permanent curl, due possibly to having the bars set with too much working edge exposed.

Hugh S. Clarke, First Vice-President.

S. A. Moak, overseer of carding, Texas Cotton Mill department, C. R. Miller Mfg. Co., McKinney, declared that "since we put in the vertical opener it has made an improvement in our work, but it seems like our greatest trouble is in high speed beaters. I think the slower you run a beater the better you will clean the cotton, and it certainly gives you less beats per inch and the grid bars have more of a chance to clean the work. You must of course build up on the fan speed to take care of the draft. With the vertical opener and the Murray cleaner we are getting a much better class of work than we did."

Effect of Doffer Speed on Breaking Strength.

The chairman at this point took up the next question prepared, which read as follows: "Compare breaking strength of yarns spun from stock carded with doffer speeds at 8 r.p.m., 10 r.p.m., 12 r.p.m., and 14 r.p.m. Keep the weight of the sliver the same in each case. Simply change the speed of the doffer. Run enough from each speed to give at least 100 half bobbins of yarns.

C. H. Megarity, night superintendent, reported first, for the Miller Cotton Mills. He said they ran tests with only two doffer speeds, 8 r.p.m., and 14 r.p.m., and that on the lower speed, with an average yarn number of 8.10s the average breaking strength was 211.3 pounds, and that with the 14 r.p.m. doffer speed, the average yarn number was 8.29s and the average break was 207.9 pounds. His conclusion was that while "the breaking strength was not changed materially on the two speeds tested, the noticeable effect was in the evenness of the roving; the doffer running at 8 r.p.m. made a much evener piece of roving than did the higher speed." He also added later that the yarn made with the lower doffer speed was smoother and better than the other.

K. G. Greening, superintendent, Houston Textile Mills, Houston, made the following report on 22s warp yarn, made from Middling cotton, full inch staple:

Doffer Speed R.P.M.	Per Cent Waste at Cards	Breaking Strength.
9	7.1	82
10.3	6.4	80
12.1	5.6	78
13.3	5.4	74

The waste taken out at the cards, he said, included fly and strippings. He said that the total waste was considably higher with the faster speeded doffer, and the appearance of the yarn was better with the low doffer speed.

Herbert A. Burow's report, on yarn made from 7/8 to 15/16-inch Middling cotton, was as follows:

No. of Yarn	Doffer Speed R.P.M.	Breaking Strength
20.16s	10.16	76.25
20.53s	11.16	71.33
20.49s	12.16	70.98

In giving the figures for his mill's tests, which he said had been conducted by Mr. Willig, Mr. Towers explained that he had reduced his breaking strength figures to a strength factor, determined by dividing the strength by the weight in grains to determine the pounds break per grain. This, he said, gives a basis for comparison when the numbers of the yarn tested vary. His figures showed the following results:

A. L. Whetstone, Second Vice-President.

Doffer Speed R.P.M.	Pounds Break Per Grain
6	1.93
7	1.98
9.50	1.94
11.75	1.91

Mr. Towers pointed out that his own test showed that it is possible to cut the doffer speed to a point that will reduce the strength of the yarn, but drew the conclusion from the different tests read that somewhere between 8

and 9 r.p.m., on a regular 27-inch doffer, seemed to give the best results. He added here that the cotton used in his test was 1 1/16-inch staple, slightly under Strict Low Middling grade.

His expressed theory was that with too low a doffer speed, the fiber was worked so long in the card that the staple was injured; too high a speed, he pointed out on the other hand, would work it too hard and fast in removing it from the card and produce likewise a weakened sliver.

Mr. Clarke suggested that perhaps the speed of the doffer would affect the breaking strength more on long staple than on the shorter lengths of cotton. The chairman said he failed to see how the length of staple would enter into it.

(The subject of doffer speeds was further discussed at the Saturday morning session, Mr Poole giving the figures of his tests at Sherman, and Mr. Towers offering some further suggestions. In order to retain the continuity of the report, this discussion will be found further along in this story where the Saturday morning session is covered. —EDITOR.)

The matter of card drafts was discussed briefly, following a question from Mr. Smith as to the card drafts used in each of the tests reported on for the different doffer speeds. Mr. Megarity said his was 100 or under; Mr. Towers reported 110; Mr. Greening 96 to 100; and Mr. Burow, 100.

Mr. A. P. Aldrich, Jr., a visitor, declared he had been told of a mill which had raised the breaking strength ten per cent by raising the card draft up to 140. Robert W. Philip, associate editor of COTTON, read from COTTON'S report of the Charlotte discussion meeting, as published in the March issue of COTTON, and reprinted in the Southern Textile Association's Books of Proceedings, these excerpts indicating that some of the men at that meeting had found it favorable to increase the card draft.

Mr. Smith asked for experiences with the up-stroke cleaner in conjunction with the vertical opener. Mr. Greening replied that he is operating one at Houston with excellent results. He said he runs Low Middling cotton and takes out about two per cent, most of which is heavy trash, with very little fly. "A short time ago," he said, "we had a break-down on the up-stroke. Prior to that time the vertical opener was not taking out anything, and then the vertical did not take out any more droppings. For cleaning I would rather have one up-stroke than a dozen vertical openers.

The chairman called upon Mr. Clarke to discuss the up-stroke cleaner installation at the Miller mill at Waco. Mr. Clarke said when the cleaner was first put in, it was taking out a lot of heavy and light dirt, but not as much as "they said it would." He described the method of operation on the blackboard, similar to the accompanying sketch, Fig. 2. His major difficulty, he declared, was with cotton choking up at the throat of the cleaner after leaving the beater. He said also that in order to get the stock through, he had to have a high draft and a fan speed on the screen section of 1,400 r.p.m,, which in his opinion was too high.

To remedy the choking up, he put in a solid board at the point *A*, in the illustration, leaving about 1½ inches of space, beveling the bottom of the board and fastening on a piece of metal, as shown. This, he said, enabled him to cut his fan speed from 1,400 to 900 r.p.m., and resulted in getting one per cent more waste from the up-stroke, and where none had been coming from the vertical, subsequent in line, he now secured one per cent there, making a total of 2¼ per cent from the up-stroke and one per cent from the vertical.

This virtually concluded the Friday evening session, and the meeting was dismissed to convene Saturday morning.

At the opening of the discussion on Saturday morning, Mr. Towers reverted back to the cylinder or Buckley type beater, bringing out one suggestion in connection with it. He said, "sometimes in handling this Buckley beater you get your beater off too far from the feed rolls and the cotton will lap around the feed roll. If any of you have that trouble, I suggest that you examine the setting to see that the beater isn't too far away, although you should have it as far away as possible without that difficulty.

Before leaving the pickers, there is one other matter I think is well worth while, that was brought to my attention while going through the mill here with Mr. Clarke.

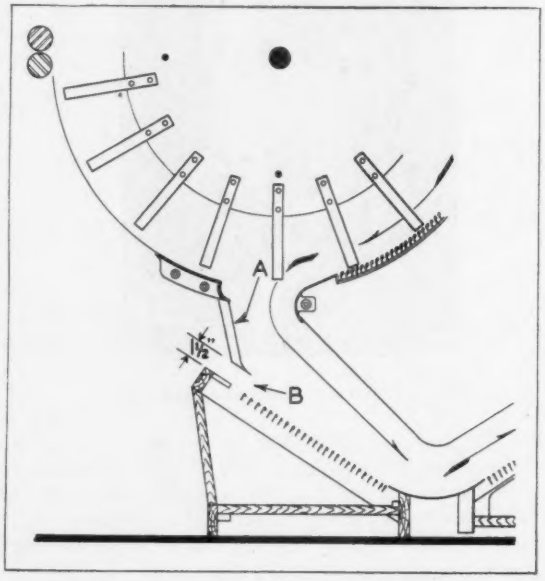


Fig. 2. This shows the change made by Mr. Clarke on his upstroke cleaner to remedy choking up. "A" indicates the solid board which he put in, this being slightly cupped at the bottom point as shown. This leaves an air space of 1½ inches, as shown at "B".

He has improved the effect of his eveners very materially by just a simple trick that works for him and I know it will work in other places. I am going to get him to tell you about it." Mr. Towers explained that this referred to the Perham & Davis evener on the Kitson picker, which was most largely used in Texas.

Mr. Clarke, in explaining his kink, said that he had noticed on some of his older pickers that sometimes, when the cotton was more fluffy than at others, the fingers dragging on the cotton would not compress it to get the true thickness, and that he noticed on the newer types of pickers there was a weight on the master lever coming out of the evener box which could be moved along the lever. He had some 18-pound weights made, with a slot 1 x 1½ inches in the bottom, which fit on top of the master lever on the older pickers and slid back and forth, being fastened with a set-screw. He said with this 18-pound weight on the lever, it would force the fingers into any thin places which came along in the lap, and that it was very seldom that

they now set back a lap.

Before passing along, President Towers said in connection with the question on the effect of doffer speeds, he had one point he wanted to raise, and hoped that Texas men, as well as the Southern Textile Association and The Arkwrights, Inc., would conduct some tests on it. He said, "With the doffer speed constant at some point between 7 and 8 r.p.m., which last night we found gives the best results, vary the card production by varying the sliver, making a lighter and heavier sliver, going to the extremes each way, and then spinning the yarn. Vary it in two different ways, first change the weight of the lap and then, with the lap normal, change the draft of the card within reasonable ranges, and note the effect. There are other variables in there besides doffer speed which have something to do with it, and we want to find what they are."

Break Draft at the Drawing.

The next question brought up read as follows: "Discuss the effect of break draft on metallic drawing rolls between the third and back rolls on the drawing frame. Make test of breaking strength of stock run with draft at this point, starting at 1.20 and increasing step by step up to 2.00. Determine this draft by removing the top, front and second rolls, breaking back all the ends of the frame except one can. Measure off a yard of sliver at the back, marking with soft crayon, then turn the frame by hand, feeding through the back and third top rolls. Measure carefully the output, which, when compared with the one yard going in, gives the exact break draft at this point." The answers reported to this were from tests made in the manner specified by the question, it was later learned, since this would be the only accurate way of determining the draft in question.

Mr. Manly reported for the Miller mill as follows: "We were a little crowded for time to conduct the test so we ran only two different break drafts on the drawing. One was our regular break draft of 1.14, and the other a break draft of 1.72. The finished weights of drawing were kept the same. The stock used was our regular warp stock, the card sliver weighing 63 grains, first drawing 67 grains, finished drawing, 72 grains. We ran quite a bit of stock through and made about 100 bobbins, two breaks on each. On the 1.14 break draft, the average yarn number was 8.10s, and we had a break of 210 pounds. On the 1.72 break draft, the average yarn number was 8.26s and the average break was 177 pounds. Therefore, we believe that the least break draft you can have, the better breaking strength you can get. Also, the finished yarn is better. We made the change on both processes of drawing, keeping the same weight of sliver in each case."

"That roving made with the 1.72 break draft was the knottiest looking stuff I have ever seen," commented Mr. Clarke, the superintendent.

Mr. Burow, reporting on his tests, said, "We did not run it through the spinning, but we tried it on the drawing frames to see what effect it would have on the sliver. We took four different drafts, 1.22, 1.42, 1.61, and 1.83. Our standard draft is 1.42. From the looks of the sliver, there was very little difference between the 1.42 and the 1.22 draft, but the further up we got the lumpier it got. That from the 1.85 draft looked like a string of wiener sausages." Mr. Towers reported that increasing the draft here, as well as reducing it drastically, would cause a decrease in strength, according to his tests, and that to his mind, "there is a reasonable point, apparently around 1.25, where you will get your best results."

The test from Sherman was made by Mr. Brady, who took five different drafts, his results being as follows, on an average number of 9.75s.

Break Draft	Strength of Yarn
1.18	225
1.28	220
1.48	218
1.65	218
1.90	222

Mr. Brady declared that he is regularly using his break draft of 1.28 at this point. Mr. Towers declared that this test bore out the ones previously reported, stating that it is something everyone should look into; he added that in all probability, most frames would have too little instead of too much break draft at this point. Mr. Brady said that even with the higher draft, he had not found the link sausage effect reported by Mr. Burow. Mr. Towers brought out that the settings of the rolls would, of course, have something to do with that.

The chairman called attention to one well known make of drawing frames that until about two years ago were built with a break draft of only 1.08 between the third and back rolls. By changing this to 1.23 as is indicated in the accompanying sketch, a great improvement would be found, he stated. See Fig. 3.

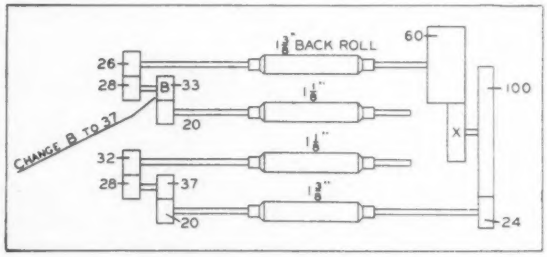


Fig. 3. The gearing plan of the drawing frame referred to by Mr. Towers. The original gear marked "B" is a 33-tooth gear, giving a break draft of 1.07. Mr. Towers' suggestion is to change this to a 37-tooth gear, giving a break draft of 1.23, which, he stated, would show a great improvement.

At this point Mr. Poole made the Sherman report on different doffer speeds, with the following results:

Doffer Speed R.P.M.	Yarn No.	Breaking Strength
8	9.29s	258
10	9.27s	257
12	9.31s	250
14	9.22s	253

His regular doffer speed, he said, is 10 r.p.m. This test was made by taking two weighings from 100 different bobbins in each case, with the card room humidity about 60 per cent and the spinning room humidity around 70 per cent.

"You see," observed the chairman, "that only bears out what we found last night, that somewhere between 7 and 10 r.p.m. is probably the best range." Mr. Poole pointed out that his breaks were around 30 pounds above standard breaking weight, and the chairman explained that if this was the case, the doffer speed would have less effect on the strength than it would in a case where the strength was right down on standard.

Mr. Poole said his cotton is 15/16 inch, average Middling.

Mr. Aldrich brought out at this point that some of the leading machinery catalogs recommend a doffer speed of 8.3 r.p.m. Mr. Towers said they apparently had justification in doing so. "The point I would like to determine,"

he added, "is whether the variation in the breaking strength is caused by the actual speed of the doffer, or by the rate at which the stock goes through the card."

Ben Edney, overseer of carding, Belton Yarn Mills, Belton, Texas, asked for the weight of lap used at Sherman. Mr. Poole replied he uses a 16-ounce lap, with a draft of 103 at the card. Mr. Brady, the carder, said he did not believe that a longer draft would increase the breaking strength. Before, he said, he had been using practically a 14-ounce lap, and that by going to the 16-ounce lap, without changing the weight of the sliver, using a longer draft on the card, the breaking strength did increase, and the web on the card looked decidedly better. This he attributed to the fact that the feed plate was worn, and the larger bulk of cotton caused a firmer bite, without slipping. No other changes were made in the settings, he said.

"They were having trouble for about six months before I went to Post," declared Mr. Burow, "with cotton from the lap getting into the licker-in in lumps. We had the feed rolls re-fluted and got rid of that difficulty."

"I believe that is a good point, and that it is the first time it has ever been brought out at any discussion meeting," declared Mr. Towers. "How did you re-flute them, on a milling machine?"

"Yes," replied Mr. Burow. "If you will examine the feed rolls the chances are you will find they have rings all around them."

"And re-fluting them gives a firmer grip while the licker-in gets in its work," added Mr. Towers.

In connection with the weight of laps, Mr. Edney said that they had been running along for years at around 100 draft on the cards, and that when Mr. Wright, the present manager, took charge, the draft was increased to 126, and that since complaints on the yarn have been materially reduced.

Mr. Poole here read the report of a 5½-day test, on 9.33s yarn, showing that over the period of a week there was a wide variation in the strength, this being attributed largely to different humidity conditions.

At this point Mr. Towers discussed briefly the matter of moisture in cotton, and the effect of different moisture content upon breaking strength, and to the difference in character found in lots of cotton of the same grade. He read the results of some tests showing that due to different character or moisture content, different cottons presumably of the same grade showed up striking differences in strength factors. Mr. Edney and others also discussed this briefly.

The Life of a Filling Quill.

The next question was, "How many Draper filling quills should normally be required per loom per year? Be prepared to discuss ways and means to reduce these requirements."

Mr. Manly, of the Miller Cotton Mills, reported, on 28-inch E Model Draper looms, a quill consumption of 6,000 quills per 100 looms per year. On 208 looms, said H. H. Tyre, he averages two quills per day per loom.

"We did not make a test for the Association," said Ingram Lee, "but we did make one for our own information, because our quill breakage had been running pretty high. We have two kinds of looms; we had the Hopedale high speed loom, something unusual out here in Texas, and we put in some Drapers, and we wanted to see which was breaking up the most quills. The figures are rather laughable, and at the same time pathetic, in a way. For several weeks' time, we averaged five quills a week on 144 Drapers and about 200 quills a week on 240 Hopedales, or 1¾ quills per loom per year on the Draper, and 42 quills per loom per year on the Hopedale. We found this excessive number due in large part to an inability to keep the fast loom transferring properly; the worn picker head would allow the shuttle to go up into the box too far."

Mr. Greening asked for the figures on this question for a four-box Crompton & Knowles loom, but no one present could furnish this information.

Mr. Philip stated that a friend had advised him that on 42s yarn, on broadcloths, running 500 looms on a day run, the quill order at his mill ranged between 5,000 and 10,000 a year; that the greatest breakage seemed to occur "in the quill skinner and battery."

Mr. Coman said, with Stafford looms, his looms use about 12 quills per loom per year; that he had discontinued the use of a bobbin-cleaning machine because of excessive quill breakage there.

The chariman here asked for suggestions for cutting down on the quill breakage. Mr. Clarke said that "in transferring the bobbin from the battery into the shuttle, a little spring gets hold of the top end of the quill and batters it up; we have set that down just as close as possible in order to shorten the length of the blow against the end of the quill."

"Our greatest trouble is in the transfer, from the worn out picker," declared Mr. Tyre, who also added that one great need was that of more efficient loom fixers, in which statement he was heartily seconded by Mr. Clarke and the chairman.

Mr. Booth, overseer of weaving at Mexia, declared one trouble at his plant had been too much filling on the quills, which Mr. Tyre said they had eliminated at Cuero when they put smaller size rings on the spinning frames.

"The Draper people have helped do away with that with their new battery, which will not take too large a quill," said Mr. Lee. "If you change to a coarser number and do not change the lay gear on the spinning frame you cannot get it in there. The proper timing of the transfer has also helped us a great deal on quill breakage."

The fifth question taken from the list by the chairman asked, "What is a reasonable percentage of quill waste, based on the total production of the weave room?"

Mr. Poole said he was responsible for that question, having asked it "because we have recently installed a few Draper looms at our mill and I just wanted to find out whether what we were doing was in line with what is being accomplished by other people. We do not have but just a few weeks' test. In the beginning we were making 1¼ to 1½ per cent, but we have since reduced that to one per cent." He said that with 24 looms and a weekly production of 3,000 pounds, his quill waste at first was 45 pounds a week, and that this had been reduced to 30 pounds.

Mr. Tyre gave the following figures: on 103,088 pounds production in two weeks, or 110 hours, his quill waste was 772 pounds, or approximately .75 per cent. He uses a sliding feeler. The superintedent, J. O. Wilson, added that it had been reduced to this low figure since the installation of a new bunch builder on the spinning frames.

On a production of 19,593 pounds average, over 26 weeks, Mr. Burow said his filling waste was 121 pounds a week, or about .06 per cent, on 230 Stafford shuttle-chang-

(*Continued on page* 178.)

Southern Textile Association

There is no question that the meeting held at Birmingham, Ala., on October 28 and 29th, by the Southern Textile Association, was a success. The program was well arranged and executed, and about the whole meeting a spirit prevailed that held the whole affair up to a high plane of interest and value. It was a tribute to Carl R. Harris, vice-president, who arranged the program, and to Secretary Gregg, and to President L. R. Gilbert, manager of the Audrey Spinning Mills, Inc., Weldon, N. C., who conducted the sessions in a most able manner. The subject of the meeting was "Greater Efficiency", and most of the talks and addresses centered around that theme.

The attendance, too, was very good. This was the first meeting to be held in Alabama by the Association in a number of years, and Birmingham was selected in the thought of organizing a division of the Association in that section of the country, this being accomplished at the Saturday morning session.

But, for whatever purpose Birmingham was selected as the meeting place, all of those attending were in hearty agreement that Birmingham is a delightful city in which to meet, and that Donald Comer, president, Avondale Mills, Birmingham, is a splendid host. No detail was too small to receive his attention in arranging for the convention—and he virtually represented the entertaining city in making the visitors feel at home, with the aid of Superintendent Z. H. Mangum and others.

President Gilbert opened the meeting in the Hotel Tutwiler on Friday morning. After the invocation by Dr. J. M. Broady, Donald Comer was called upon for the address of welcome. After graciously welcoming the visitors, Mr. Comer turned to some serious thoughts in connection with the industry. He mentioned the great development that has occurred in the South, pointing out that in 1880 the South contained only 687,000 spindles, consuming 220,000 bales of cotton, and that now the section uses over 5,000,000 bales of cotton and operates over 17,000,000 spindles.

"I wish to speak to you about what I consider some of the causes, and your part in this astounding record," said Mr. Comer. "Dr. Broadus Mitchell says, 'The South's progress has been made possible by the development of manufacturing. The old system of a staple crop grown by slave labor guaranteed stagnation. The great mass of the whites were in no less subjection than the blacks.' If this be so, then indeed you have played a doubly important part.

"In 1860 there were 30,000 spindles in South Carolina; today, 5,500,000, but it is the early days that interest us. Last year, in Graniteville, S. C., a great shaft was erected in the memory of William Gregg, and for what? Because he was the inspiration of what I have just quoted from Dr. Mitchell and particularly he believed that cotton manufacturing in the South had a magnificent future, and so in 1849 he built the Graniteville Cotton Mills. He believed that white people from impoverished and washed away mountain farms should be welcomed into factory villages where they might find better homes, steady work, schools and churches. To Graniteville came William Gregg, and Dr. Mitchell says, 'No other cotton manufacturing plant in the South has had the same influence as Graniteville.'

"Thank God for a monument to a man for accomplishments in peaceful pursuits. Thank God for Lindbergh and for the nations of the world who stopped in their daily march to glorify a man for an act in which just one life was risked and that his own. We will never ban war until we make peace heroic.

"Since 1849 many mills have been built throughout the South, not all from the same unselfish purpose, but whether or no, all helping in the general plan that the Alabama Power Company calls diluting agriculture with manufacturing. Down through the ages human hands, all unwittingly, have been receiving Divine guidance. Twenty-five hundred years ago, when the children of Judah in bondage in Babylon asked to be freed and allowed to return to their own country and rebuild again their homes and Temple, Cyrus, a heathen King, not only gave his permission but aided with his own resources, and God said to him, 'I have girded three, though thou has not known me.'

"If we have been only thoughtless or selfish in playing our parts in this great result, it is well for us now to take

President L. R. Gilbert.

for our guide the best of leadership, a leadership which thinks not in terms of self but others, a leadership devoted to high ideals. Our industry has many such leaders. Time permits the mention of only a few. If it were my lot to work with my hands at the loom, I would like to work for men like Mr. Fitzgerald at Danville. I know that his interest in me and my work would not stop at my ability to earn a dividend. When southern manufacturers gather each year at Blue Ridge to discuss their common problems, you will find Mr. Fitzgerald turning our thoughts to the improvement of human relations. The Cones have for good cause built a great business at Greensboro. They have become the largest denim manufacturers in the world but deeper down and beyond that ambition was a purpose of helpfulness to man and country. Let me quote what John A. Law, president of Saxon Mills at Spartanburg, has said:

"'My family and I have lived for the last twenty-four years in the Saxon Mill village, and I would be recreant to the feeling of profound gratitude which I have for the privilege of living in such a community and for the treat-

ment we have received if I did not voice my appreciation.

"'I have often said, in public and in private, that when it comes to the old-fashioned virtues that constitute genuine neighborliness, kindliness of heart, sobriety, Sabbath observance, and scrupulous regard not only for the rights but for the welfare of others, no one in the world has better neighbors than I have.

"Saxon Mills has been in existence for approximately twenty-six years, barely long enough to show the product of its citizenship, but the following are its noble products:

"'W. Simpson Rogers, one of the most useful citizens of Spartanburg; J. Furman Brooks, principal of West End Graded Schools of Spartanburg; Herbert Nelson, now a professor in the University of Kansas; Quincy Martin, who, though blind, completed his course at Textile Industrial Institute and whose mother is now weaving in Saxon Mills that he may complete his education at the University of South Carolina; Miss Roberta Lovelace, who has gone from Saxon Mills to the University of South Carolina; also Walter Johnson, who won the oratorical honors both at Duke University and Wofford College in the 'Know Methodism Contest.'

"V. M. Montgomery is president of Pacolet Mfg. Co. I quote Dr. Beachley, a Maryland health officer in 'Nation's Health,' February number: 'Pacolet is one of the best, most beautiful and attractive industrial centers in America today. The health record of Pacolet has been attained by a process of care extending through the years.' For 1925 Dr. Beachley gave the general death rate from all causes in the United States, per thousand, as 11.7; South Carolina, 12.2; and Pacolet, 4.0. During that time no baby in Pacolet under one year of age died and there was no maternal mortality.'

"Along the Chattahoochee River eastern dollars have built a great string of mills and George Lanier of Georgia has been the guiding hand. In these mill communities he has developed such a wonderful system of schools that when our Governor appointed a committee to survey Alabama's schooling conditions and needs, George Lanier was selected. In Huntsville, Ala., Joe Bradley lived, we honor his memory. He was known and loved by us all. None in our industry had a greater heart. His passion was people and people loved him, loved to work for him.

"I have never been to Stonewall, Miss., but I know it is a place where self respecting people can work for I know Oscar Berman. I have visited his great overall factory in Cincinnati. If any of you ever feel yourselves slipping in your faith in the fairness of men—employer and employed—in their ability to work out their problems together, I recommend a visit to Mr. Berman's plant. I would not leave out John E. Edgerton of Tennessee, but I will not attempt any words of my own, I refer you to the Manufacturers Record of April this year.

"We have heard it said that if the world is not a good place for all of us to live in, it is not a good place for any of us to live in. Under such leadership and high purpose and accomplishment as these can any of us afford to be satisfied with less. There is another and greater reason for the present success of our industry. You, you who belong to the Southern Textile Association and you who are eligible. You are the foremen in this great big business.

"A good man has approved the word foreman. He said 'just drop the "e" and you have "for-man".' I am sure that most of you have worked your way to leadership from the ranks. You are leading people with whose every problem, trial and concern you are familiar and because you have not forgotten, you retain their respect and loyalty and the only word of advice I have today is that you continue to fail not this trust. Since under your leadership industry has grown, conditions improved, and people become more useful and happier, just so we must remember that conditions must continue to improve. Keep on *keeping on*. Let your voice be heard. The people who are trusting you and me were in the beginning largely gathered from the mountains, from agriculture unproductive for many reasons. For these first comers to the mills an unknown writer speaks for them:

"'However crude, illiterate, or helpless we seemed, they have never said of us that we were immoral or irreligious. We had no schoolhouses. We were working in the fields by the side of your slaves turned free. We were as poor as the peons of Mexico and as far removed from hope. We would not take root in the soil of agriculture for we belonged to the kingdom of industry.

"'We came here in the morning of American history. We backwoodsmen gave you your flag. We are bone of your bone and flesh of your flesh. We are neither stepchildren nor adopted. Not one un-American boy or girl stands in the long line of us.

"'Can you in the power of imagination stand in our places with us, and, above all, can you quit saying "They" and "Them" when you talk of us, and may we hope for the time when we shall hear you saying "we" and "us?"

"'We promise to translate our economic relations into the values of literature, morality and religion.'

"Woodrow Wilson said that it was his belief that the millions of people who live in the great mountain districts of Virginia, West Virginia, Tennessee, Kentucky and the Carolinas had been preserved there to supply a great future need in American life. He could well have included North Alabama and North Georgia.

"These, their children, and grandchildren, are working progressively under your direction. Your responsibility to spin cotton is linked to that of helpfulness in the making of men and women. From the ranks of those working under your direction have come not only leaders in our own industry but leaders in every other branch of useful and noble endeavor. How worth while. When you have been patient to listen to the problems of just one man or one woman, you followed the greatest teacher, for Christ, with only three years to save a world, found time to teach his greatest truths to just one woman, just one man.

"I know the foremen of Avondale Mills would like for me to say something in honor of the good men and women with whom we have all worked for so many years, but I am unwilling to take more of your time. Mr. Law speaks for us all. Simple justice demands that I say that in my relations and contacts with Avondale Mill employees I had less to give and more to learn of the worth while things of life.

"From such environment, and from such stock, came a Daniel Boone, a Sam Houston, came Abraham Lincoln. Your opportunity for continued service and discovery has no limit. Whether executive, superintendent or department head, we are all foremen, we have entrusted to our direction iron machines and human machines. With this record of great accomplishment behind us, let us go forward ever keeping as our guide the high ideals of William Gregg. Let us strive that the mill where we work shall become a better and happier place for people to live and work. Emerson

said 'A man's best friend is he who leads him to do his best.' Such has been and is your great privilege and the industry today testifies to your success. Our best requires the best conditions, the best tools. You have met here to discuss them. The South is moving, you are helping."

L. L. Brown, chairman of the board of governors for the Association, responded fittingly to Mr. Comer's welcoming remarks.

The next feature was an interesting discussion of "Regulating Weights from Moisture Regain in Cotton," by W. A. L. Sibley, superintendent, Whitney Mfg. Co., Whitney, S. C. This talk, together with some illustrations, will be found complete beginning on page 118 of this issue of COTTON.

Oliver G. Murphy, superintendent, Shawmut Mill Division, West Point Mfg. Co., Shawmut, Ala., was the next speaker, discussing "Well Kept Machinery and Its Relation to Efficient Operation." It appears on page 115.

These two talks were generally conceded to be two of the most interesting papers ever delivered before the Association.

The routine of reports from the chairmen of the Association's different discussion divisions was next, and concluded the meeting of the morning. Hugh S. Clarke, superintendent, Miller Cotton Mill Division, C. R. Miller Mfg. Co., Waco, Texas, brought the greetings of the Texas Textile Association, which is affiliated with the Southern Textile Association. Since COTTON has published complete reports of the various discussion meetings at the time of their occurrance, and since the reports at Birmingham represented summaries of those discussions, readers are referred to past issues for this information.

Trip Through Steel Mills.

Friday afternoon was spent by most of the delegates visiting one of the steel plants of the Tennessee Coal & Iron Company. This expedition proved a most interesting trip to all of those participating, as this kind of process was something entirely new to most of the cotton mill crowd. Friday evening was given over to the customary banquet, at which the Avondale Mills Band furnished the music, being assisted by some youthful entertainers from the mill. Dr. Frank Willis Barnett, of Birmingham, delivered a highly humorous address.

Observations in European Mills.

David Clark, editor, *Southern Textile Bulletin*, Charlotte, N. C., was the first speaker at the Saturday morning session, discussing his observations in European mills on a recent trip abroad, during which he attended the Rotary International convention at Ostend, Belgium.

Mr. Clark, before discussing the mills, declared it as his opinion that much of the discussed antagonism toward America does not exist, but that the impression is created because of a very small minority of American travelers in Europe, who form the wrong impressions at the same time leaving the wrong kind upon the people of the countries visited.

He prefaced his discussion of the mills by stating that he had opportunity to go in only a very few, and pointed out that general conclusions cannot be drawn from such a few examples. He first visited a mill at Lille, France, on coarse numbers. The only mechanical difference between that plant and American practice, he said, was that instead of using a can supply behind the drawing frames, this mill uses a sort of ribbon lap machine with a railway head delivery arrangement onto the drawing frames, in the thought that this improves the work and saves labor and time. Mr. Clark added that the condition of this mill, as well as the other plants visited, when compared with American conditions, could be called dirty.

The next textile plant visited was a rayon plant in Italy. Upon reaching England, he visited a mill at Huddersfield, England, being shown through by the manager, whom he characterized as being very open and anxious to show him all of his operations. Contrary to the current reports, Mr. Clark said he failed to find an extraordinary amount of attention being paid to opening and mixing in the few plants he visited, emphasizing again that these possibly should not be considered as representative of general practice.

At Huddersfield he found them making 30s yarn from single roving with a draft of 16.50. Another unique proposition, he said, was the use of an old-style warp mill, a circular affair, instead of the American style of warper. He brought out at this point that English practice is to have separate plants for spinning and weaving, among their reasons being that having the spinning mills in one locality and the weaving mills in another, permits the specialized training of operatives for each operation. However, he preferred the American system, since one family will frequently contain a member particularly adapted to spinning and another whose ability can best be utilized in weaving, etc.

Mr. Clark next discussed the attitude of the English toward experimentation, declaring that he found them to be a most conservative people. He cited instances such as asking a man what card draft he used and whether he had ever tried any higher, receiving a negative reply, the same experience occurring in connection with the number of processes of drawing used. Mr. Clark also visited the card room of another English mill, going in with a salesman friend, but did not inspect the remainder of the plant.

In Mr. Clark's opinion, the explanation for the difference in English and American practice and attitude lies largely in the different characteristics of the people. Those who remained in England, he said, represent the conservative element, more content with conditions as they exist, while those who left their homes to establish a country in America, were more of an adventurous spirit, and that this same trait extends into American business and American industry. In his opinion, the English mills do not secure as high a production per spindle and per loom as the Americans do, but a lower labor cost gives them a market advantage, which he said should be offset with proper tariff measures.

Cost Accounting from the Superintendent's Point of View.

George W. Duncan, cost engineer, Cotton-Textile Institute, Inc., was the next speaker, discussing the matter of cost accounting from the superintendent's viewpoint. After outlining the importance of costing, Mr. Duncan said in part:

"Up to the present moment Cost Accounting Committees have been appointed for the following groups: Carded Sales Yarn, Wide Sheetings, Narrow Sheetings, Southern Section and Eastern Section of the Print Cloths. In addition, plans are now under way for a similar meeting to appoint a Cost Committee for the Osnaburg and Chambray Groups. We also expect to establish close contact with the Fine Cotton Goods Exchange of New Bedford which has already given valuable attention to the problems of

cost for the fine goods mill.

"When these studies are completed, it is proposed to draw up an outline of what is considered sound principles for submission to outside accounting firms and cost engineers for advice and criticism. The approved plan will then be offered to the members of the Institute, but it is distinctly understood that the outline of principles will not be binding upon any mill. In this connection, please bear in mind that the Institute will not attempt to install cost systems in individual mills. The field is entirely too large —therefore, our recommendation is that competent authority be employed wherever the desired need is felt to exist.

"Upon you gentlemen attending this meeting falls the responsibility of largely determining the success or failure of the cost system. The completed fabric cost can only be accurate to the extent that the starting basic data is correct. Therefore, it is absolutely necessary for you to educate your overseers and second hands, to keep accurate records of production, payrolls, repair work done, etc.

"Some of you have the false idea that this involves a lot of unnecessary red tape—that you and your overseers' duties are to superintend production and management rather than waste valuable time at a desk; but I wish to assure you from actual experience that if you will install an adequate system it will make your particular job much easier than where you attempt to operate under the well-known rule of thumb methods in common practice in many mills of the country today. Instead of wearing out shoe leather in looking for your particular trouble, in all probability the reports would have given you warning of the impending break in time to correct it before any real damage had been done. In other words, these systems of modern reports are to the mill superintendent what the thermometer is to the physician.

"The starting point on which a complete fabric cost is based, is the determining of what constitutes normal production. There are wide differences existing today in the running time of plants, due to local conditions, types of mills, locations and general conditions of business. I believe the tendency of the majority of superintendents is to determine that normal production will give a minimum cost per pound. In other words, costs are based on 50 to 52 weeks per year, with 90 to 93 per cent production. This manifestly gives more pounds than you can possibly expect to obtain from your mill and makes no provision for loss of running time by reason of holidays, half days, vacations, enforced shut-downs, etc.

"I cannot urge too strongly the necessity for facing facts with regard to normal production. On account of your practical experience, mill treasurers largely depend upon you gentlemen to tell them the per cent production that you will get off on any style. My earnest plea is for you to be very conservative in your reply, because I have seen so many instances where normal costs were based on the superintendent's estimate of 85 per cent and later, after the order had been taken, the actual production turned out to be 73 per cent. This can only mean a decided loss to your company, and is one of the factors why the anticipated profits do not prove out with the actual results.

"You will no doubt be interested to know that other successful industries of this country have long since abandoned the obsolete principle of determining minimum cost figures. Regardless of whether they operate day or day and night, costs are based on single shift capacity and such normal production as their experience over a period of at least five years has indicated. The practical application results in a more stable market and costs are figured on a normal which does not represent maximum capacity during prosperous times, nor minimum capacity during periods of curtailment.

"With such a basis, if the normal is exceeded there is an over-absorbed burden which should be charged to profit and loss and if the normal is not maintained there will of course be an unabsorbed burden chargeable to the same account. The gain in good periods should approximately offset the loss in poor periods.

"Before leaving the important subject of normal production, may I say just a word of caution regarding night running? My experience has been that most mills do not really know the result of overtime operation. Labor is generally figured at a 10 per cent increase but in reality, the result over a period of time represents more nearly an actual increase in cost of approximately 12 per cent. Depreciation on machinery and equipment should be increased in proportion to the overtime operation. Power, supplies and repairs, insurance and carrying charges are higher. The percentage of irregular goods, seconds, shorts, etc., are unquestionably greater. The operating efficiency is usually much lower, and there is the large intangible problem of a

Seventh Discussion Division Formed by Southern Textile Association at Birmingham.

To Include Mills in Alabama, Mississippi, Louisiana, Arkansas, and West Tennessee.

At the conclusion of its deliberations in the convention at Birmingham, Ala., on Saturday, October 29th, the Southern Textile Association organized its seventh active discussion division, to include the mills in Alabama, Mississippi, Louisiana, Arkansas, and West Tennessee.

Oliver G. Murphy, superintendent, Shawmut Mill Division, West Point Manufacturing Co., Shawmut, Ala., was named as chairman of the group, and he will select an advisory committee in the near future. A program of discussion will be arranged, and a meeting held soon, with Birmingham as the probable selection for a meeting place because of its accessibility from all of the territory covered by the new division.

This further extends and enlarges the scope of the Association's work. Its general divisions now include one on carding, with J. O. Corn as chairman; a spinning division, Carl R. Harris, chairman; a weaving division, L. L. Brown, chairman; a master mechanics' division, H. H. Iler, chairman; and a dyeing, bleaching and finishing division, Paul F. Haddock, chairman. The Eastern North Carolina Division, with T. W. Mullen as chairman, covers the mills in the eastern part of the Tar Heel state. The formation of this new group expands the scope of the work in territory covered.

At the Birmingham meeting, President L. R. Gilbert forcefully and ably outlined the growth of the Association along discussion lines, and pointed out the possibilities of another division in the territory uncovered up to that time. The original idea was to take in Alabama and Mississippi, but in the discussion which bore on the subject, it was pointed out that because of geographical situation, the value and extent would be enhanced by including also the mills in the bordering states of Louisiana, Arkansas, and Western Tennessee.

lower market price, created by the surplus production caused by overtime operation. It is felt that all of these factors must be taken into consideration in determining to what extent the gain by overtime operation is *real* or merely apparent.

"I now turn to other elements of cost which are directly under the supervision of the superintendent and the first item that occurs to me is the payroll. After the normal production has been decided upon, it is then a comparatively simple matter to build up the budget payroll for comparison with the actual weekly payrolls. This subject has been carefully studied and I think it is safe to say that most payroll forms today are adequate with regard to the distribution of labor to departments. However, it is the operation or use of the budget and actual payroll that I would like to call to your attention.

"One suitable form of Summary of Payroll consists of a long sheet with all departments itemized printed on the left side and containing seven additional columns as follows: (1) Budget Hours, (2) Actual Hours, (3) Budget Payroll, (4) Actual Payroll, (5) Cost per pound, (6) Gain, (7) Loss. From these columns, budget hours and budget payroll are compared with actual hours and actual payroll and the gain or loss entered in its respective column. At a glance, the superintendent can see where the overseer exceeded the budget allowance and it has been found that it is more effective to tell the boss carder that he has lost the company $248.00 this week rather than to say that his card room labor cost has gone up one-sixteenth of a cent.

"Since cotton and waste are such important factors of the total cost and since many mills use radically different methods in arriving at the value of cotton in cloth, I think it will be well to outline a typical net waste calculation.

TYPICAL NET WASTE CALCULATION.

Stock in process, beginning January 1st		89,000 lbs.
Plus total cotton opened during year	1,394,000	
Plus purchased yarn	63,000	
TOTAL AVAILABLE	1,546,000	
Less stock in process end	83,000	
Cotton and yarn used during year	1,463,000	
Less all cloth produced	1,262,000	
Less yarn sold	None	
Gross waste made	201,000	
Per cent gross waste (201,000 ÷ 1,463,000)		13.73%
Amount received for waste sold was	$5,000.00	
At 20 cents a pound it would purchase 25,000 pounds of cotton, therefore:		
201,000 lbs. — 25,000 lbs. = 176,000 lbs. Net		
1,463,000 lbs. — 25,000 lbs. = 1,438,000 lbs. Net		
Per cent net waste—(176,000 ÷ 1,438,000)		12.24%
(NOTE: In arriving at the cost of cotton in cloth, the price of raw cotton must be divided by 1.00 — .1224% or .8776).		

"The importance of correctly arriving at the replacement cost of cotton in determining cost when quoting prices for sales purposes cannot be stressed too strongly. You gentlemen know full well that when the raw material advances, buyers attempt to place orders at the price prevailing before the advance, but whenever there is a decline in the cotton market they insist on buying at the lower figure. These facts are not at all consistent.

"In this connection, I would like to stress the difference between what the general public considers as the advance in cotton prices from what you, as manufacturers, actually have to pay. On October 15, 1927, December contracts were 20.91 cents. On November 12, 1926, December contracts were 12.48 cents. From the quotations, the public sees an advance in cotton of only 8.43 cents per pound. On the other hand, the mill has its basis to consider, which has advanced materially, as well as its waste factor, so that cotton in cloth this year actually costs 26.07 cents per pound compared to 15.56 cents last November. In other words, while the actual market has apparently advanced 8.43 cents, the manufacturer is forced to pay an actual advance of over 10.51 cents per pound. As a concrete illustration take the present situation in wide sheetings: the manufacturing margin on 10/4 bleached bolt goods is six cents per pound less today than it was a year ago. This, translated into plain English, means that the mills making wide sheetings must manufacture for six cents per pound less to make or lose the same amount. All manufacturing elements are substantially the same, therefore it cannot be done.

"Now a word in reference to the information which a superintendent should furnish the cost clerk for each different construction, and please bear in mind that unless this data is accurate the final cost may be decidedly misleading.

"First comes the *construction data* such as width, ends and picks, yarn numbers, width in reed, length of cuts slashed, length of cuts woven, pounds per cut, ends in body of warp, ends in selvage, per cent size on warp, per cent contraction in filling, pounds of warp yarn per cut, pounds of filling yarn per cut, number of harness, ends per dent, weight of cloth from loom, shipping weight of cloth, per cent irregular goods, and running quality. Under production data may be listed 100 per cent production yards, estimated per cent production, pounds per spindle of warp and filling yarn.

"It is also necessary to decide on the kind of loom, width of loom, picks per minute, number of looms per weaver, price per cut, looms available, and number of spindles per loom.

"In conclusion, it will, no doubt be interesting to quote briefly some of the advantages derived from a complete fabric cost system. They enable an executive to choose from several styles of cloth those most profitable for his mill; result in more intelligent competition within the industry; show up constructions which have been sold at a loss; act as a guide to the efficiency of the entire organization; point out salient facts which can be placed before governmental bodies; inspire confidence in the buyers that selling prices are based on a full knowledge of the cost of the cloth offered for sale; make it practicable to estimate, with reasonable accuracy, the cost of the cloths which have not heretofore been made; indicate any inefficient use of existing machinery and requirements for additional equipment in order to better balance the plant; and make it possible to set up production, expense and sales budgets and so forecast the financial requirements.

"From actual experience in operating cotton mills over a period of years, from Massachusetts to Texas, I have found that adequate records will do all of the aforesaid.

"Manufacturers today are depending more and more on cost systems to steer their business through shoal water. It has been proven in steel, automobile and other successful industries that modern methods of accounting will eliminate much of the guess work from their problem and is considered, by many, to be the best insurance against business loss."

High Speed Winding, Spooling and Warping.

The concluding feature of the prepared program, bearing on the theme of "Greater Efficiency," consisted of two papers discussing experience with two of the new high speed winding and warping and high speed spooling and

warping equipments. The first paper discussed the Barber-Colman system of high speed spooling and warping, being prepared by Fred L. Still, superintendent, Victor Plant, Victor-Monaghan Company, Greer, S. C. It was read in Mr. Still's absence by Marshall Dilling. John H. Howarth, assistant superintendent, Lanett Mill Division, West Point Mfg. Co., West Point, Ga., described his installation of the Universal system of winding at high speed from cones and high speed warping in conjunction therewith.

Mr. Still's paper follows in part:

"In presenting to you some of the "Advantages Derived from Automatic Spoolers and High Speed Warpers," I am going to confine myself to general conservative statements which I am sure will be right in line with the experience of other men who have this type of spooling and warping. Personally, I know we are getting results from our spooling and warping that we could not get with the usual machinery, and due to the high production and simplicity of operation, we are able to operate part of our plant at night. This would be impossible with the regular machinery because we do not have convenient floor space available for the additional machinery required to spool and warp the yarn that night running would require.

"It is an admitted fact that yarn cannot be improved during the process of spooling and warping. That is to say, after the yarn leaves the spinning frame it is impossible to increase its strength or elasticity. It is, of course, possible to remove slugs, gouts and such imperfections, but wherever a slug or gout is broken out, a knot is the result. Therefore, we can only strive in spooling and warping to injure the yarn as little as possible.

"Yarn spooled and warped with high speed machines reaches the slasher in approximately the same condition as when it left the spinning frame; that is, none of the elasticity has been taken out of the yarn during the spooling and warping process. This is due to the fact that the yarn has been subjected to no severe strain in either process.

"At the spooler the yarn is wound off the end of the bobbin, no tension devices of any kind being used. It is wound criss-cross, thus making it possible to build up a self-sustaining package using a headless spool.

"This package is known as a cheese and the headless spool on which the yarn is wound is known as a cheese core. This core is made of metal and has ball bearing centers. When the cheeses are full the spooler automatically throws them back, refusing to wind additional yarn. This feature is highly desirable, eliminating the human element of judging when to take off the cheeses and also holds down to the minimum the amount of yarn in process at this point. Also, the spoolers may be set to make different size packages to give the yardage desired for the section beams when it is necessary to make special or given yardage sets for the slashers.

"As the cheeses are filled, they are taken off their spindles and placed on a carrier, which consists of a portable base containing three upright rods, and therefore, known as a trident. Each trident contains twelve full cheeses, four on each rod. This method of handling is quite an improvement over the former method of throwing spools into boxes or even stacking them, thus damaging the yarn by allowing the spools to come in contact one with another, often injuring the yarn due to the rough heads on one spool coming in contact with the yarn on another spool.

"Every one acquainted with spooling operations, knows that it is possible for a spooler girl to tie up ends without making kinks, but we, also, know how very difficult it is to get spooler girls who will observe sufficient care to insure elimination of kinks. With the automatic spooler, a mechanical device is used for automatically taking the slack out of the yarn after the knot is tied, the operative having absolutely nothing to do with the tying of the knots. This work being entirely automatic, the human element is eliminated and our tests show about 90 per cent less spooler kinks.

"On our automatic spoolers, the number of employees necessary to handle a given amount of yarn is about one half the number that would be required with ordinary machinery. Two girls on an automatic spooler will do the work of about six on ordinary spoolers using hand knotters. This reduction in help naturally results in a consequent reduction in spooling and warping costs. In other words, the help being cut in half, the spooling and warping costs will also be reduced approximately 50 per cent. This reduction in help releases to us girls who can be advantageously used in spinning or weaving.

"In changing our old spooler help on to the automatic spoolers we did not have any difficulty, because of the fact, that in operating these spoolers considerably less skill is required, and in fact we have taken girls who have never worked in a mill before and in a very short time they made very efficient spooler tenders. Practically all spooler rooms, from time to time, have learners on their spoolers and we all know what a terror this is for the weave room, because there will be all kinds of defective work going out of a room where learners are being used. This condition is eliminated where the automatic spoolers are being run. Learners on the automatic machines cannot make bad work —they, when first going on these machines, cannot do as much work as the experienced help, however, what they do is just as good as the best spooler operatives we have.

"Production from these machines is largely dependent on the size of bobbins delivered from the spinning frame. On ordinary spooling, production per girl depends upon the same factor, therefore, they are comparable. Two girls on one automatic spooler handling 30s yarn spun on 1¾-inch rings with a 6-inch traverse, can average 10,000 pounds production in 55 hours.

"In making up piece rates by which to pay the spooler operatives, several methods may be used. I think a rate per trident, which contains twelve full cheeses, is generally conceded as the best, however, a rate per pound may be easily set and of course a rate per box of yarn delivered to each side may be used the same as on the usual machinery.

"In creeling the warper, it is not necessary to take the cheeses off the tridents, where they are placed by the spooler girls, since the complete trident, containing 12 spools, is inserted in the creel.

"The warpers run at a speed of 500 yards per minute, and no tension devices of any kind are used with them. In spite of this great speed, the tension on the yarn is very much less than on ordinary warpers. A device known as a Tensiometer is used to determine the tension on the yarn during warping. Tensiometer readings show that the tension on a thread warped from spools is about one ounce, whereas the tension from ball bearing cheese cores is about one-quarter ounce. The tension on the yarn being much less at both the spooler and warper, naturally results in less yarn breakage and consequently fewer knots are re-

quired. Also, less breakage at the warper results in better work at the slasher and straighter warps at the looms.

"As all the cheeses run on ball bearings, the tension at the warper is not only small but is very uniform. Yarn wound on the spools and beams under high tension, suffers loss of elasticity and will not stand as much strain at the looms as yarn wound under low tension. Uniform tension in winding makes it unlikely that any thread will be strained more than the others, while low tension gives the yarn more strength to stand the load. Both are important factors in reducing broken threads at the loom, and less stoppage at the loom means greater production from the same looms with the same labor.

"On the warpers, beams of 30,000 yards 30's yarn, can be run in 60 minutes. Allowing 20 minutes for piecing up broken threads and 20 minutes for creeling, the time actually required for creeling and warping a beam is 100 minutes or one hour and forty minutes. It is evident from this that one high speed warper on 30's yarn has a capacity of about 30 beams per week.

"The high speed warpers are equipped with a very accurate measuring device, which makes it possible to wind all beams approximately the same length. This results in a decided reduction in waste at the slashers. It is easily possible to maintain an average of less than one-half pound waste per beam at the slasher. Usually more yarn can be put on the cheese than on a spool, making it possible to wind larger beams at the warper, thus reducing the amount of creeling necessary at the warper, giving longer sets at the slasher, making necessary less changing at the slasher, which results in less waste.

"In our mill, the same statement regarding the help required for operating the spoolers, is also true of the warpers; that is, it only takes half the number of warper tenders to produce on the high speed warpers the same pounds as it would on ordinary warpers. Also, we have run numerous beams of 30's yarn, 30,000 yards, with from 6 to 12 stops.

"About half the floor space required for ordinary spooling and warping is required for complete equipment of automatic spoolers and high speed warpers. In mills already built, this releases floor space which can usually be used advantageously. And in building a new mill, this saving in floor space makes quite a reduction in the initial plant investment.

"The amount of yarn in process is reduced at least 75 per cent as compared with the amount in process with the usual machinery. This is due to the fact that one high speed warper will do the work of approximately six ordinary warpers. There is always a beam of yarn at each warper, either on spools or on the beam; therefore by reducing the number of warpers required, the amount of yarn in process is automatically reduced in the same proportion.

"This high speed machinery is a wonderful help in mills where it is necessary to change quickly and frequently the styles of goods as it only takes a little more than an hour to run a full beam; therefore, match beams may be run and in several instances we have had sets of yarn being slashed in an hour or so after receiving an order for goods. And of course samples can be made up in less time than that. The number of ends on the warper can be changed quite readily; in fact no time is lost in changing from one number of ends to another when creeling. This makes it possible to change styles and get out short orders in much less time than by the old method.

"The low uniform tension, the elimination of spooler kinks and the introduction of uniform weavers knots, must necessarily result in a reduction of loom stoppage due to warp breakage. On tests conducted we have found the warp breakage 22 per cent less on warps spooled and warped on the high speed machinery than on warps spooled and warped on the usual spoolers and warpers. This test was made on looms running side by side and all on the same construction of goods. Therefore, it is evident, with a decrease in loom stoppage due to fewer warp ends breaking that our production has been increased in the weave room.

"In summing up the many advantages of high speed spooling and warping, the paramount advantage, in my opinion, is the low uniform tension under which the yarn is handled. Every mill man knows how desirable this is, especially where high sley and high pick goods are being run. Where we have good even yarn with all the elasticity possible kept in it up to the loom, this one feature goes a long ways in making a difficult weave run nicely. Also with the tendency today of using low grade cottons, depending on our modern cleaning machinery to raise the grade, so to speak, it is an admitted fact that to some extent the staple suffers. And be this very slight, this undesirable condition of the staple cannot be wholly corrected in the finished yarns. It probably will not be so noticeable in weaving light fabrics, however, in high sley goods this weakened fiber shows up in the running qualities of the goods. With conditions such as this, the high speed machinery helps in putting the yarn to the loom in about the same condition as it came from the spinning frame.

"The manufacturers of the high speed spoolers and warpers assume that 3 per cent of the net cost of this machinery will cover all supplies and repairs annually. We have found this percentage high as our supplies and repairs for a year average only ½ of 1 per cent.

"Numerous times we have been questioned regarding the type of men we use as second hand and section man on our high speed machinery and I would like to say in this connection that we have the same men in charge now that we had when we were operating regular spoolers and warpers only."

The concluding paper was presented by Mr. Howarth, describing the Universal system. He said that "one of the many questions we are asked is 'Why did you prefer the Universal system?' The principal reason is its flexibility, in that it can run with any kind of a wind. Our warp yarns are all filling wind." He then pointed out that since conditions vary, the figures he would quote would doubtless not be applicable directly under other conditions, but that the proportion in saving should apply.

"We are just half way in the installation of our equipment," he said, "having five warpers and eleven winders, leaving us to put in five more warpers and ten more winders. This will give us one more winder than was figured on to supply the ten warpers. Based on an average of 14s yarn, the investment is as follows: Winders, creels, warpers, 15,000 wood cones, 200 wood section beams, $81,000. The saving outside of floor space and stock in process includes 105 pounds of beam waste per week, 84 pounds of creeling waste per week, and 53 pounds of spool waste per week, a total of 242 pounds per week, which, figured at 25 cents a pound, is $60.50 per week, making an annual saving on waste of $3,146. The num-

ber of hands used in the spooling and warping under the old original system was 138, at $1,590 per week, giving a cost of .00795 per pound. The number of hands with the new system is 100, at $1218 per week, a cost of .00609 per pound, both figured on 200,000 pounds per week. The number of employees saved is 38. The labor cost represents a saving of .00186 per pound, which on 200,000 pounds per week is $19,344 per year. Thus the waste and labor saving total a yearly saving of $22,490, giving a net annual return of 27.4 per cent on the investment of $81,000.

"Also, we do away with 50,000 wood and fiber spools, the depreciation of which is $1,250 per year. Also eliminating the great amount of yarn carried on spools all of the time, which is really a big saving, as the yarn has to be made and a great many times is carried until it weakens so it cannot be run.

"We made a test for loom stoppage on 16 looms, eight looms on warps made by the new system and eight on warps made on the old equipment. The following was the result:

	Loose Ends	Knots	Gouts	Kinks	Total
Old System	29	167	29	9	234
New System	24	142	24	6	196

"This gives a total of 78 stops per day on eight looms, or 9.6 stops per loom per day, on the old system; and 65 stops per day on eight looms, or 8.1 stops per loom per day on the new system.

"The yarn is delivered to the winders on filling wound warp bobbins—any wind can be used. The winder is operated at a speed of about 500 yards per minute, the yarn being wound on the wooden cones, with the first end being placed in a slot at the bottom of the cone. The cone when full holds about four pounds of yarn. I would say right here that we had a little trouble to get the girls accustomed to the winders, after leaving the spoolers, but I do not think it was any different than we always have when we try to introduce new ideas or new machinery. We use the Boyce weaver's knotter on the winders and also in creeling behind the warpers.

"The creel is built in such a way that two cones are placed on in a manner that the end from either will run true to the same guide or tension. First, a cone is placed in position, and threaded, leaving the end on the inside of the cone, which has been left extending on the winder, hanging. Another cone is then put in the creel, and the end of the yarn is tied to what is the inside end of the first cone, so when the first cone is empty it follows that it picks up and starts on the second cone. Then the creeling hand takes off the empty cone and puts in the full one, and repeats the operation already described, so that the creeling is continuous and the warper is never stopped for creeling. We have a rack built that holds 100 cones and use this instead of boxes to carry the cones to the warpers, the cones being placed in the rack at the winder.

"Remember that the cones in the warper are stationary. When the first cone is empty it automatically transfers to the full cone, this eliminates the tying of ends like on the old warpers, and the pulling through of the knots which make the saving in waste already referred to.

"You will readily see that there is no limit to the length of threads in the creel; the limit being the size of the section beam. We are using wooden beams with 28-inch heads. We are putting 15,000 yards to the beam, 400 ends of 14s yarn. The warpers run 300 yards per minute. We had figured eight warpers to do our work but got two extra to do away with night warping as we run 25,000 spindles at night, and now spool and warp all of the night yarn in the day run.

"The cones are emptied every time and returned to the winders, and this is where the saving of carrying dead yarn comes in.

"We find that we have better beams on these warpers with the wooden heads than under the old system, and we note improvement in the running of the warps made from these beams.

"As a summary, I would say that we have found that we saved on floor space, on waste, on spools, on yarn carried, and have improved the warp due to a more even tension maintaining elasticity in the yarn, less stoppage on looms, and though, of course, we have cones between the winders and warpers, there is nothing like what you have on spools all over the room on the old system."

In conclusion, Mr. Howarth declared, in answer to assumed questions, that the winder hands run between 24 and 32 spindles; that the section beams are better made on the new warpers; that they get a little more yarn on the same size beam. As to the waste behind the slasher, the beams run out about the same, beam for beam, but since more yarn is put on the beams, waste is saved and doffings reduced. He said on the whole the run-out of the beams compares very favorably with the old system.

He explained there is no chance of losing twist in tying the first and last ends of the cones in the creel, since the winder hand must put the end as she starts in the slot at the bottom of the cone. His experience with the wooden beam, he said, "is all to the good," there being no warping of the wood, no breaking of the heads, etc. In his opinion, it is not practical to use iron heads at a speed of 300 yards a minute on the warper, even if made heavier, since the momentum caused by the high speed would cause a heavy beam "to jump all over the place."

The session was closed with expressions of thanks to Mr. Comer, and the City of Birmingham, for the gracious hospitality extended, and a discussion as to the formation of an additional discussion section or division was held. It should be mentioned that at the Friday session, on motion of Marshall Dilling, seconded by Robert W. Philip, a telegram of sympathy and good wishes was forwarded to C. S. Tatum, superintendent of the Consolidated Textile Corporation's Bonham Division, at Bonham, Texas, who was confined in a hospital at Dallas following a serious operation.

The place and time of the Association's semi-annual meeting in the summer of 1928 was left to the choice of the officers of the organization.

Pepperell Mfg. Opens Atlanta Office.

Pepperell Manufacturing Company has opened a sales office in Atlanta, Ga., through which Lady Pepperell sheets and pillow cases, and other products of the company will be offered in the Southeast.

Ferguson Gear Co. Now Has N. Y. Office.

Ferguson Gear Co., Gastonia, N. C., has opened a new branch office at 77 Cortlandt St., New York City, from which the New England states and New York, New Jersey, Pennsylvania, Delaware, and Maryland will be covered.

CURRENT TOPICS

Cost of Road Building and Maintenance.

Since cotton manufacturers, particularly those in the South, are directly interested in the construction of roads and streets on their own properties, and to a large extent connected with municipal affairs in many communities, it is felt that the following figures with reference to the cost of road building and maintenance will have a direct appeal. They are taken from an exhaustive research report made in Cuyahoga County, Ohio, which includes the city of Cleveland. The survey covers the cost of the maintenance of the roads in that county since the year 1904 and was prepared from official records.

Leaving aside the pages of graphs and data which are most important to the engineer, but are not readily understood by the layman, the results of the research are illuminating. It was found that different kinds of pavement cost originally from about $2.00 a unit to as high as $3.40, but the survey was based more particularly on the repair and upkeep expenses.

It was found that at the end of ten years, the $2.00 macadam road had really cost the county $4.75.

Asphalt roads which had cost the county $2.85 to build had cost $4.40 after eight years' repairs had been added in.

Concrete roads which the county had bought for $3.00 cost $4.50 after ten years' wear.

Brick roads which had originally cost $3.40 to build had cost $3.60 at the end of ten years' time.

Surpluses and Taxes.

Tax reduction is again to the front in Washington. A fourth general cut, since the war, in the burden of Federal Government taxation is now being maneuvered at the first session of the new Congress. It is made possible chiefly by the fact that no one of the preceding three general tax reduction bills passed by Congress went as far as it might have gone. And it is probable that the one now in process will fall considerably short of what might be done.

The United States Treasury Department estimates that the revenue acts of 1921, 1924 and 1926 brought about tax curtailments aggregating $1,604,000,000. That is to say, the Government's collection via taxes would be that much more than they are but for those cuts. Yet since 1919 the Government has collected more than $2,500,000,000 more than scheduled needs required. This means that taxes might have been reduced by each bill more than twice as much as was done by it. The surplus of the last fiscal year was the biggest one of all. It amounted to more than $600,000,000. But the Treasury insists that taxes should not be cut now in the extent of more than $225,000,000, although another surplus of around a half billion is expected at the end of this fiscal year.

It would seem, therefore, that the Treasury's position is an over-cautious one, just as was the position taken by it with reference to other reduction bills. There is some merit, however, in the Treasury's position. The surpluses of the last eight years did not come wholly from taxes. They came in much part from collections on the score of non-recurrent items, such as recovery of loans made to the railroads and by the War Finance Corporation, the settlement of disputes anent back taxes and war salvage. These sources will not yield so much in the future. Moreover, better business conditions than were anticipated have caused yields from many tax sources to be somewhat abnormal.

The Treasury Department is for playing absolutely safe. It naturally prefers to handle surpluses than to wrestle with deficits. Surpluses are of great help in readjusting the big war debt. They have been employed, of course, in debt retirement, which has progressed at a rate more than twice that which was scheduled. By applying the surpluses to it the sinking fund has been more than doubled. These surpluses have enabled the Treasury to make readjustments that have lowered the carrying cost of the remaining large debt, now about $19,000,000,000, incurred on account of the war.

Rapid retirement of war debt has been the invariable policy of the Federal Government. The Treasury would like to continue this policy, which is facilitated by surpluses.

If it be a good policy, why not make outright provision for carrying it out? Why pursue it by the indirect method of collecting more in taxes than by arranged schedule the Government needs?

There should be no huge surpluses. However well such be employed they necessarily mean either inefficiency or deception in the Government's dealing with the taxpayers.

If taxes are cut only $225,000,000 at this session other large surpluses are likely to accrue. A cut of $500,000,000, however, might involve a risk of a deficit resulting at some future time unless obviated by an increase later on in taxes.

A cut in the extent of the low figure only will not allow much leeway for readjustments of taxes as now levied. All are agreed that the tax on the net incomes of corporations should come in for first consideration in the making of cuts. This tax has not been lowered since the war. The repeal of the capital stock tax, and the consequent raise of the tax on corporation income, causes it in fact to be higher than in wartime. The tax now yields nearly twice as much as it did when first imposed. Nearly half of the Government's internal revenues collections come out of the tills of corporations, which now, it is estimated, pay more in all kinds of taxes than in dividends.

The Federal tax of 13½ per cent on corporations might be cut to 10 per cent. This would mean a reduction of about $300,000,000 in revenues. If the entire reduction advocated by the Treasury were applied to this item, the cut in the corporation tax would not be more than to 11 per cent.

There is rife demand, however, for the cutting of other items, notably ones still described as "nuisances." The most energetic demand comes from the automobile indus-

try, which wants the remaining sales tax of 3 per cent on passenger cars abandoned. This tax now yields only about $60,000,000 a year, which is considerably less than the Government has been contributing towards the building of roads, chiefly for motorists. The only other "nuisance" taxes that are of any great bother are the ones on admissions to theatres and on dues paid to clubs. Only about $30,000,000 comes from both of the last two sources, but the taxes are good reminders to millions of folk that the Federal Government still is a costly enterprise.

The cost of the Government is now on the climb. Now about three times what it was before the war, it is not likely ever to be less than at the present time. But the country is growing, particularly in those respects which make for Federal Government revenues from sources like the tariff, excise taxes on tobacco products, and takings from incomes. The national debt is not a dangerous one. Its rapid retirement may have a deflating effect and over-deflation is now probably to be feared more than inflation. For example, it would take more by way of labor or its products to pay off the debt now than it would have taken to pay it off in 1920 when it was several billion dollars larger. Debt doesn't seem to be a fearsome phenomena in other quarters.

The bigger the tax cut by Congress at this session the better it will be for all concerned, including the Government.

The Progress of the Institute.

The one-day meeting held in New York City on October 19th, representing the first annual meeting of The Cotton-Textile Institute, Inc., was a demonstration of a new day in the industry. In attendance were the outstanding leaders in the country's cotton manufacturing business, and others representing practically all of the Institute's member mills, which now include a large majority of the country's spindles. This unquestionably made it the first authoritative gathering of the entire industry since cotton manufacturing reached a magnitude approaching the eminence it occupies today.

The meeting was devoted mainly to a review of the organization's activities during the first year of its operation. The feature was the address of President Walker D. Hines, who covered generally what has been done in the way of organizing the Institute and the industry, and the accomplishments of the various divisions and groups. His report presented a phenomenal progress—unusual in the effectiveness and completeness of organization during the initial year of the Institute's life, as well as in the amount of actual achievement and contact occurring during that time.

In addition to Mr. Hines' complete report, there were statements from several of the group chairman as to the work of their divisions. Stuart W. Cramer and Robert Amory, vice-presidents of the Institute, also spoke briefly, as did other leading figures in the industry. Throughout the entire meeting there prevailed an atmosphere of satisfaction and confidence as to the Institute's achievements and possibilities.

All officers were re-elected, including, in addition to those named, the secretary, George A. Sloan, and the treasurer, G. H. Milliken. Election of the board of directors and executive committee was also held.

Any skeptical feeling that the Institute has failed to justify for itself a place as an integral part of the industry would without question be removed by a study of President Hines' report, and doubt as to the ability of the organization to cope with the problems in its respective divisions dissipated by an appreciation of the achievements of President Hines and Secretary Sloan and their co-workers.

Faith in the organization among its members is a cardinal attribute which the Institute enjoys. A belief in it is found to be almost universal. To attain its high possibilities, however, it must have an active individual co-operation from every source in all of its undertakings. At the meeting, it was announced that the membership at that time included 447 mills having nearly 22,000,000 spindles, which represents more than two-thirds of the country's active spindles. Of this number, almost 1,000,000 spindles were added to the membership during the first year. Unquestionably, the Institute can and does represent the majority of the industry. With this influence, and the capable leadership it fortunately enjoys, the prediction is that this first year of activity is but an earnest of greater future accomplishments.

What the Southern Mills are Doing.

Greenville, S. C., and its environs held the spotlight during the past month, which was exceptionally live with promotions and announcements for the establishment of new textile plants in the South, and for the extension of existing properties.

One of the new plants announced for the Greenville territory was the Piedmont Print Works, at Taylors, S. C., where the Southern Bleachery, Inc., already has a plant in operation. The new enterprise is formed by William H. Bannon, of the Bannon interests of Rhode Island, and associates, who include Harry R. Stephenson, of the Southern Bleachery, who will have active supervision of its operation. R. J. Stephenson, also of the Southern Bleachery, will be the superintendent. Mr. Bannon is president. The plant will engage in dyeing and printing, it being understood that four printing machines will be removed to Taylors from the East. J. E. Sirrine & Company, Greenville, are the engineers. A plant and 60 homes for operatives will be built. Work to complete the plant rapidly is being pushed. The capitalization of the company is $1,000,000.

The Southern Pile Fabric Company has been organized at Greenville, to erect and operate a plant on pile fabrics. It will be operated by Brooks Brothers, upholstery manufacturers of Philadelphia, and will be located near the site of the old Riverview mill.

Active work toward the promotion of the new mill at Traveler's Rest, S. C., just north of Greenville, is progressing. This plant will be established by Woodward, Baldwin & Company, of New York City, and will be put up under the direction of Augustus W. Smith, president of the Brandon Mills. It is understood that the promoters have been considering the purchase of equipment from the Renfrew Manufacturing Co., at Adams, Mass., for removal to the new enterprise at Traveler's Rest.

Announcement was made last month that 700 new Draper looms will be installed in the Dunean Mills, at Greenville, in the near future, these to replace equipment installed when the mill was established in 1912. It is understood also that a similar number of looms will be placed

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"RECOGNITION," says a writer on industrial marketing, "is the standing of a manufacturer, product by product, among the men who control the buying in the markets to which he sells."

To purchasers of industrial chemicals, Mathieson recognition is something that has been built up through years of constant, dependable service to the chemical consuming industries. It is the result of considering the interests of the consumer first, of maintaining uninterrupted contact with the product from raw materials to consumer, of supplying products of definitely known quality, of combining progressive Mathieson merchandising policies with the most up-to-date plant and warehouse facilities.

Regular renewal of contracts, year after year, and the constantly growing demand for EAGLE-THISTLE Chemicals backed by Mathieson service, furnish tangible evidence of this nation-wide recognition.

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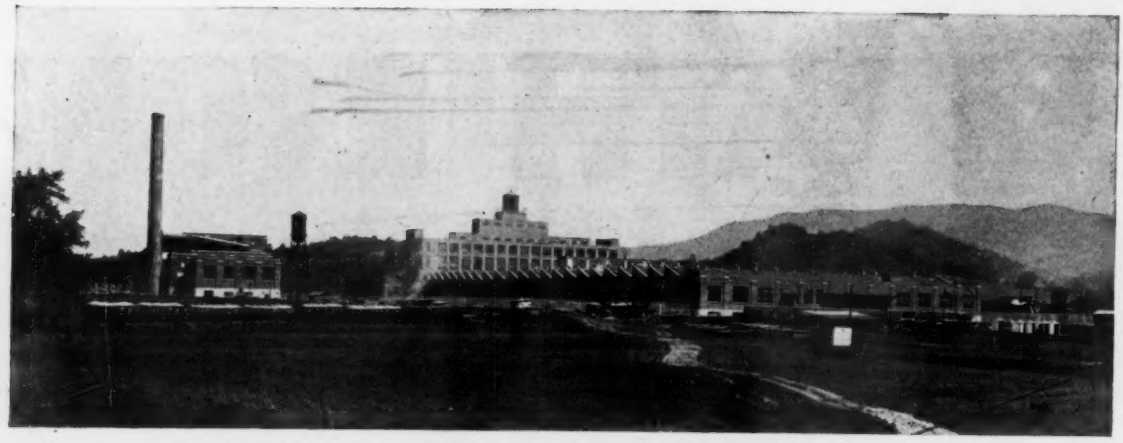


AMERICAN BEMBERG CORPORATION, ELIZABETHTON, TENN.

On page 1197 of the October number, the caption used with the above cut listed the plant, in error, as being located at Johnson City, Tenn. In the story therewith it was also stated that this plant, and the new construction of the American Glanzstoff Corporation, was at that city. These statements were incorrect, however, as both projects are within the corporate limits of Elizabethton, Tenn. "Cotton" regrets the mistake and gladly publishes this correction.

in the Watts Mill, at Laurens, S. C. R. E. Henry, of Greenville, is president of both companies.

Appleton Manufacturing Co., Lowell, Mass., have dissolved the Appleton Manufacturing Co., of Anderson, S. C., their southern subsidiary, and merged it with the parent company. Authorization was given at the same time to expend $780,000 in moving machinery from Lowell to Anderson, and for erecting necessary buildings there, where the company at present operates the former Brogon Mills. It is understood that 35,000 spindles and 900 looms will be sent to Anderson from Lowell, to augment the present equipment, which now includes some machinery previously removed. J. E. Sirrine & Co., Greenville, are the engineers. It is announced that at Anderson an addition will be erected, to be 280x105 feet, two stories, of standard mill construction, of brick with steel beams.

According to report, the Chiquola Manufacturing Co., Honea Path, S. C., will be considerably enlarged by the addition of a four-story building, 130x76 feet, on the south side of the plant. Additional manufacturing equipment will be installed, and in addition to the new machinery, it is understood that considerable of the present machinery will be replaced.

Ware Shoals Manufacturing Co., Ware Shoals, S. C., have increased the capital stock from $1,300,000 to $2,000,000. Some time ago preliminary plans for a 30,000-spindle addition were drawn, but were held in abeyance, and it is understood that the increase in capitalization will probably be used for the consummation of these proposed enlargements.

Another announcement states that at Hartsville, S. C., a finishing plant to be known as the Hartsville Bleachery, will be established by Fred B. Voegeli and Robert W. Bole, president and treasurer, respectively, of the Easton Finishing Co., Easton, Pa. The company is organized to bleach, dye, mercerize and finishing cotton piece goods. The building will be 800 feet long, providing for continuous range production. Mr. Bole has been connected with the Easton Finishing Company at Easton since 1918. Mr. Voegeli began in the finishing business with an association of 2½ years at the Union Bleachery, Greenville. In 1910 he went with the Mansfield Bleachery, going with the Easton Finishing Company in 1915.

Contract for extending the water and sewerage system of the Mills Mill, Woodruff, S. C., to serve the new houses for employees made necessary by the new addition, has been let to Fiske-Carter Construction Co. Lockwood, Greene & Company are the engineers.

According to report, Chesnee Mills, Chesnee, S. C., plan the installation of 10,000 additional spindles, which will increase the present capacity of the plant by about one-third. Lockwood, Greene & Company are the engineers.

Whitney Manufacturing Company, Whitney, S. C., recently let contract to Allis-Chalmers Mfg. Co., through the Charlotte office, for the installation of a number of Texrope drives. Lockwood, Greene & Company are the engineers.

Beaumont Mfg. Co., Spartanburg, S. C., plan the erection of 50 additional dwellings for the use of mill operatives, involving an expenditure of approximately $75,000.

United Mills Company, Mortimer, N. C., which is controlled by the Hickory (N. C.) Spinning Company, will be removed to Hickory. The plant has an equipment of about 6,000 spindles, it is understood.

Michael & Bivens, Inc., Gastonia, N. C., have secured the contract for installing electrical equipment and power and lighting wiring in the new plant of the Thies Dyeing & Processing Co., Belmont, N. C. J. E. Sirrine & Company are the engineers.

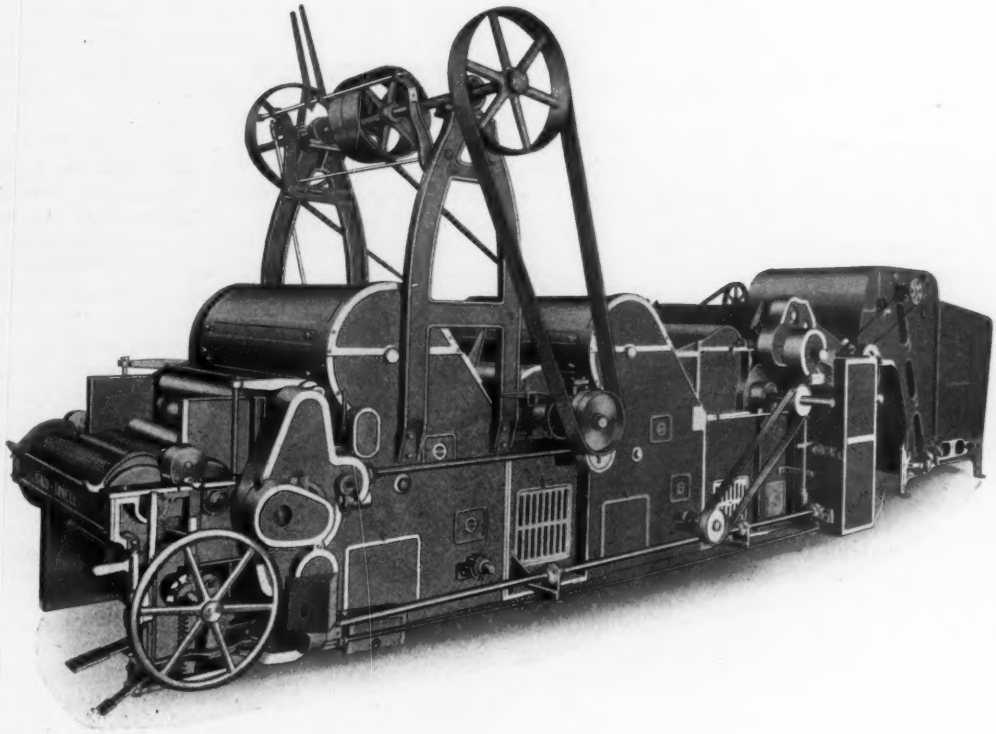
Art Cloth Mills, Lowell, N. C., has been organized as the National Weaving Company, with R. L. Stowe president, and A. C. Lineberger, Jr., secretary and treasurer. The new organization, which has acquired the interests of Judson Mills in the property, will issue $300,000 preferred stock to pay off the current indebtedness.

Proximity Mfg. Co., Greensboro, N. C., will add 1,000 looms, and a shed in which to house them will be erected immediately. J. E. Sirrine & Company are the engineers.

Gagner Mills, of Adams, Mass., operating a silk and rayon throwing and weaving plant, will be removed to Statesville, N. C., it is announced by Bailey T. Groome, secretary of the Statesville Chamber of Commerce.

OUR NEW BREAKER PICKER

With 24" Buckley Beater



This new Picker is equipped with a 24" Buckley Cylinder Section (similar in design to our Lattice Opener & Cleaner) which accomplishes more cleaning than any previous type of beater. Other improvements are the No. 8 Evener, Ball Bearing Spiral Spur drive, Differential Knock-off, New Type Adjustable Grid Bars, Rack Safety Device, Roller Bearing Calender Rack, etc.

This new Picker is the LAST WORD in

Dependable Performance
Economical Operation, and
Refinement of Detail.

SACO-LOWELL

Largest Manufacturers of — *It pays to Install Modern Machinery* — *Textile Machinery in America*

147 Milk St., Boston, Mass. **Charlotte, N. C.** **Greenville, S. C.** **Atlanta, Ga.**

Industrial Dyeing Corporation of North Carolina, West Worthington Avenue, Charlotte, N. C., has begun operations, this being one of three plants operated by the Industrial Dyeing Corporation of America. Louis Wisner, president, and Karl Ginter, vice-president of the North Carolina corporation, will remove to Charlotte. Mr. Ginter will have active charge of the plant. The company engages in the dyeing of rayon yarns exclusively.

Plans are being drawn for an addition to the Scandinavia Belting Company plant at Charlotte, N. C., it is announced by Lockwood, Greene & Company, who are the engineers.

A company to take over the Kinston Cotton Mills, Kinston, N. C., which have been out of operation temporarily, has been formed by H. F. Bonney, J. C. Rasberry, L. J. Mewborne, and others.

Commerce, Ga., was assured of another cotton mill when Governor L. G. Hardman, president of the Harmony Grove Cotton Mills there, announced definite plans for a new unit to his properties. It will be approximately 10,000 spindles and 300 looms. Robert & Company, Atlanta, Ga., are the engineers.

The new mill at Carrollton, Ga., which will be managed by Pomp L. Shaefer, and which will install approximately 4,000 spindles for the manufacture of coarse yarns, has been named Caroline Mills, Inc. Park A. Dallis, of Atlanta, has been engaged as architect and engineer.

The addition to be made at the Arnco Mills, Newnan, Ga., which will practically double the original capacity of the plant, will be 150x436 feet. Lockwood, Greene & Co., through the Atlanta office, are the engineers.

Lanett Bleachery & Dye Works, Lanett, Ala., have awarded contract for the additions to their plant, which were announced last month. J. E. Sirrine & Company are the engineers.

Crystal Springs Bleachery Company, Chickamauga, Ga., is erecting 40 additional dwellings for operatives, in addition to doing considerable repair work in the present village.

LaFayette Cotton Mills, LaFayette, Ga., have announced plans for the addition of 5,000 spindles and 110 looms, together with necessary houses in the village. A new office building also will be erected. Robert & Co., Inc., Atlanta, Ga., are the engineers.

White Oak Cotton Mills, Proximity Mfg. Co., Greensboro, N. C., will erect a $25,000 finishing plant, one-story, of brick construction with composition roof.

A contract covering considerable humidifying equipment has been awarded to the American Moistening Co. by the Appalachian Mills Co., Knoxville, Tenn. The Shelbyville Mills, Inc., Shelbyville, Tenn., are installing new automatic humidity controls furnished by this company.

Wayne Mills, formerly Cardinal Mills, West Point, Miss., have been purchased by J. W. Sanders, of Jackson, Miss., who it is understood, will operate the property as a unit of the Cotton Mill Products Co.

Work has begun on the plant of the Pioneer Braid Corp., at Union, S. C. The building will be one-story, of standard mill construction. Machinery and equipment for the plant will be removed from New York.

Aronson & Hirchsfield Silk Co., Inc., of Paterson, N. J., will remove a plant to manufacture silk cloth to Morristown, Tenn. The plant will be one-story, of concrete, brick and steel construction.

In the new addition of the American Net & Twine Co., Blue Mountain, Ala., 4,104 additional spindles will be installed. The building is a two-story, 114x114 foot extension to the existing plant.

The control and management of the Opelika Mfg. Co., Opelika, Ala., has been acquired by local interests who owned it prior to its acquisition by George H. Lanier and associates several years ago. The new company has a capital of $500,000. The officers are M. M. McCall, president and treasurer; John Allen Jones, vice-president; and James G. Spann, secretary. John T. Henderson is superintendent. Mr. McCall was previously in active charge of the old company for more than twenty years. The directors elected are: W. T. Andrews, John V. Denson, H. A. Bedell, C. M. Jernigan, John Allen Jones, C. S. Shealy and M. M. McCall. It is announced that the new management is changing the mill over to make white yarns, which was the product prior to 1923, when those acquiring the mill at that time changed it to colored yarns.

It is understood that the name of the Ashcraft Cotton Mills, Florence, Ala., has been changed to Florence Cotton Mills, and, according to report, an extensive addition to the productive capacity will be made during the coming year.

Michael & Bivens, Inc., Gastonia, N. C., have been awarded contract for material and installation of a complete electrical drive at the Imperial Cotton Mills, Eatonton, Ga.

It is understood that A. B. Patton and W. G. Mitchell, Tuskegee, Ala., who have been reported interested in establishing a mill at that place, have definitely made plans for the formation of the company, and that a part of the equipment has been purchased.

J. E. Kale, of Lincolnton, N. C., J. A. Gardner, of Charlotte, and R. F. Craig, of Stanley, N. C., have purchased the buildings and other real property of the Lola Gingham Mills, Stanley, N. C., from Hesslein & Company. The equipment of the plant, which formerly had 350 looms, was removed some time ago, and was not included in the sale. Mr. Craig was former treasurer of the company, and it is understood that the new owners plan to re-equip and operate the mill under his direction.

New England Mill Situation.

New England mills have begun to curtail production in a moderate way. They have been selling less than half their output for several weeks past and as orders have begun to run out and they have been unable to replace them with profitable business they have allowed looms to stand idle. In the fine combed goods centers mills have been stopping looms on plain goods of a standard character but still have many fancy goods to make for the coming Spring season.

Business on broadcloths has been exceptionally poor both in carded and combed styles while many of the plain rayon and cotton mixtures have been very slow and prices have become wholly unremunerative. Action to lessen production is being taken entirely on individual initiative. Figures of sales issued by the Association of Cotton Merchants of New York showing sales in October of only 68 per cent of production included in part additional reports from some New England centers whose figures are submitted through The Cotton Textile Institute, Inc.

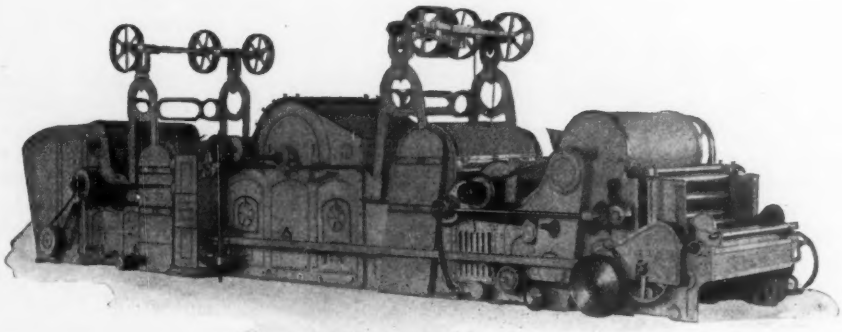
A great deal of interest is manifested by New England

H & B AMERICAN MACHINE CO.

Pawtucket, R. I.

Southern Office: 814-816 Atlanta Trust Co. Bldg., Atlanta, Ga.

Our New Consolidated
Automatic Feeder, Buckley Opener and Breaker Lapper



This machine is acknowledged to be the most efficient and productive Cotton Opener yet developed for the treatment of cottons.

It combines greater cleaning power with more gentle treatment of the cotton. The Continuous Gridded surface from the Cylinder to Cages and Full Width Feed gives Perfect Regulation of Weight, Improved Quality, Increased Production and Reduced Cost of Operation.

Let us show you how to increase quality and production and reduce your costs.

A Modern Consolidated Picker Unit
for All Classes of Cotton

---

manufacturers in the test the Institute has been undergoing in recent weeks. The statistics of the industry show the wisdom of lessening the output until demand revives. As there is no legal right in this country permitting an association to order a regulation of production the matter of curtailing is wholly in the hands of individual manufacturers. Costs of staple goods of a print cloth yarn character are so much higher in New England than in the South that self interest forces mills there to decline to pile up stock. It is believed by many holders of stock in southern mills that if costs of production were closely calculated there, the wisdom of curtailing the output in that section would be better appreciated than it now is, but whatever the cost may be, it is self-evident that the margin for profit in cloth manufacturing at current prices is too meager to warrant continued full production.

Members of the Institute in New England who were prominent in its organization are strongly of the opinion that if agents of southern mills will urge a regulation of production to demand, it will not be a great while before more profitable manufacturing margins are restored. Should production continue to run as far ahead of demand as the statistics now indicate it is felt that prices will become so low that quick recovery in the spring of a presidential year will be long deferred.

There are many mills in New England still amply engaged on goods not generally made in the South. In New Bedford, the largest fine goods center, it is stated that fully 90 per cent of a capacity output is under engagement and will continue so well over the turn of the year. Some of the Rhode Island mills are running full time with unfilled orders of better volume than a year ago. Mills like the Naumkeag, Pepperell, Edwards, and others of large loomage in the northern tier are running to capacity. The Amoskeag plant is about 65 per cent occupied in the cotton goods division. Mills like the Berkshire in Western Massachusetts have a substantial business in hand.

Some of the Connecticut mills have business enough booked to keep them comfortably occupied into mid-winter in the improbable event that no further business will be booked. The proportion of fine fancy output in New England mills is greater this year than ever before. There are several that are not running a single loom on plain goods. Rayon mixtures comprise a substantial part of the product but there is a large output also of sheer yarn dyed fancies for dress wear, curtain materials, and other purposes in the looms. The reorders on many of these goods have come forward in smaller lots than is customary but there is a general confidence in the belief that textures of this character will be less hampered in sales by silks or other materials than has been true in recent years.

Financial reports of several mills made public in the past month have been more satisfying than any in the past two or three years. While mills as a whole have not made large earnings they have done so much better that more confidence is being reflected by bankers and investors. There are still many crippled corporations in this section, notably so in Fall River and Lowell but many of the plants have demonstrated an ability to meet competition or to find markets for new products that have been made in recent months.

The latest quarterly dividend report of Fall River mills for the fourth quarter of the fiscal year 1926-27 showed an average distribution of .996 per cent on a capital of $40,685,000. Twenty-four of thirty-eight corporations listed paid no dividend. The Pilgrim mills in Fall River paid an extra dividend of 12 per cent in addition to a 2 per cent quarterly regular dividend. The King Philip mills disclosed a surplus of $2,000,000, or within a quarter of a million dollars of its capital stock. The Luther mills, engaged on fine carded yarn goods, paid a 2 per cent quarterly dividend. Plans are under way there for the recapitalization of the Granite Mills through reinvestment by stockholders of $200,000. Committees of stockholders of the Osborn Mill have made application in the courts to compel temporary receivers of that corporation to make a thorough appraisal of the property with a view to permitting stockholders to provide additional capital.

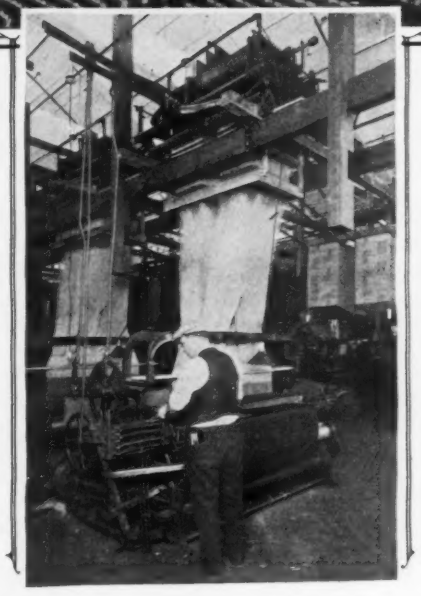
The Tecumseh Mills of that city paid what is believed to be a final dividend in liquidation of 5½ per cent making a total of $135 a share paid to stockholders as the proceeds of the sale of the property to the Davol Mills. In that city there are still several plans proposed looking toward a consolidation of several plants but no definite action has been taken.

The city of Lowell has been even more seriously hurt in its textile properties than Fall River in the past three or four years of liquidation. The Appleton Mill stockholders voted at the last annual meeting to transfer 30,000 spindles to the southern plant of the company and it is thought that when those have been installed another 30,000 will be shipped for installation probably before the Fall of next year. These additions will give the Appleton a southern plant of 60,000 spindles which can be operated day and night.

The Hamilton mills of Lowell, the Tremont & Suffolk, and part of the Massachusetts have been disposed of in liquidation. That part of the Massachusetts that was sold to the Pepperell company did not prove profitable in operation and through an agreement between management and operatives a 10 per cent reduction in wages became effective November 1st. The assessors of Lowell are also endeavoring to promise further relief by a reduction of taxation and a strong effort is being made to place the plant upon a profitable basis for the coming year.

A great deal of the second hand machinery being offered for sale from mills that have been closed is being distributed among other New England mills. But the machinery dealers say that the second hand market is glutted and it is next to impossible to secure a reasonable bid for any property however well equipped some of its departments may be. An auction sale of the Quidnick Mills during the month resulted in bids of hardly 10 per cent of the investment. Curiously enough, on the day this information came to hand a cable from Lancashire, England, was received in the New York markets stating that one of the oldest and largest plants in that section had been offered for sale and received only the same proportional bid from probable purchasers.

There has been a great deal of discussion in manufacturing and investment circles recently growing out of the unwillingness of local New England banks to back investments of a textile character. The complaints heard state that bankers have been willing to loan only to mills having a surplus of quick over debts and an immediate earning capacity. They have not considered plants that are out of debt suitable securities for loans. The contention of manufacturers is that where plants are out of debt, good character, creative ability, youth, or good management may be tendered as an inducement for loans, com-



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THE hundreds of delicate patterns obtained by Craftex Mills, Inc., Philadelphia, in their famous wall coverings, upholsteries and draperies are woven on looms guided by HALTON JACQUARD MACHINES.

This superiority of workmanship and design is well exemplified in the draperies and upholsteries of the beautiful Earle Theatre in Washington, D. C., designed and supplied by this manufacturer.

Craftex Products are as extensively used as they are known, and the fact that these master craftsmen have used Halton Jacquards since the founding of their Company, is evidence of their dependable performance.

We do harness building of every description.

We are prepared to furnish at short notice comber-boards, lingoes, mails, etc. Ingrain and Brussel parts.

We do replacing and repairing of Jacquard machines of other makes as well as our own.

Immediate and expert attention our guarantee.

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"USE A HALTON JACQUARD AND YOU USE THE BEST"

munity banks should encourage the borrowers. The matter has been discussed quite freely in some communities and it is believed that in view of the earnings of some plants during the past year banking investment will undergo a change.

Manufacturers and merchants in New England are not expecting the textile industry to be as buoyant in the coming year as it was this year due to the approach of a presidential election, the high cost of cotton, and the threat that production may not be regulated to demand, in time to prevent a further demoralization of profit margins. At the same time because of the very great change that has come over the character of product being handled and the very aggressive merchandising methods that are now being pursued, many of the mills will continue to do well and will certainly not be allowed to fall back into such losses as those sustained by them in 1926.

Machinery plants are beginning to slacken up somewhat compared to a couple of months ago. They have done a good business on preparatory machinery and still have many orders in hand for looms and spinning frames. The finishing plants are doing about an average of a 65 per cent business with some plants running overtime on speciality rayon products.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, November 17th, 1927.

Although there is little change in the indicated crop compared with one month ago, 12,842,000 bales versus 12,678,000, the trend of the market has been downward, values showing a further loss for the month of about $7.50 per bale, making a total decline of about $25 per bale compared with the season's peak in early September when the government's forecast was for a yield of 12,692,000 bales.

Unlike the corresponding time last season when spot sales were very large, due to the low prices prevailing at that time, the demand for spots in the South during the past month has been comparatively light, and exports from the United States have been comparatively small, to November 11th. 2,451,000 bales versus 2,957,000.

The fact that spinners of the world were not buying as freely as last year, and the falling off in exports, created bearish sentiment which was intensified by less favorable domestic cotton goods advices and unfavorable trade reports from Manchester.

These features of the situation extended to the present time when the December position became in the process of liquidation, and there was much liquidating of December or switching to Spring deliveries, all of which had the effect of undermining the market.

During this period no attention was paid to the importance of takings by spinners of the world, which to November 11th, totaled 4,748,000 bales against 4,698,000 to corresponding date last season when total takings for the whole season amounted to 17,923,000 bales. The larger takings than last year were made possible by European spinners drawing heavily on European visible stocks. On August 5th, the European visible supply of American cotton was 1,010,000 bales larger than last year, but on November 11th, it was only 245,000 bales larger than last year.

Nor was any heed paid to the record breaking consumption for the first quarter of the season in the United States where, including linters, 2,099,000 bales were consumed versus 1,862,000 for the corresponding period last season, of which 686,000 bales were consumed during October against 644,000 in October of last year.

It is argued, however, that with the turn of the new year, since American and European spinners have not been able to dispose of their full mill output, that world consumption will decrease, whereas after said date last year it increased. Furthermore, it is contended that since this season's prospective supply, including last year's carry-over, provides a total of about 21,000,000 bales against 24,739,000 last season, there is an ample supply for this season, which is probably true, but at a price.

While the statistical position of the staple is gradually growing stronger abroad, it is comparatively stronger in the United States where the seasons' indicated supply, exclusive of mill stocks, points to about 16,100,000 bales including last year's visible carry-over on this side of the Atlantic.

Such a supply would afford only about 8,900,000 bales for exports this season against 11,243,000 last season, and would provide takings for American mills of only about 7,220,000 bales against 8,220,000 last season, which takings and exports would about absorb every bale of this season's indicated supply in the United States.

To last Friday exports from the United States were only 506,000 less than last year, and American mill takings were only 292,000 smaller than last season. To keep within the above allowances, exports for the season would have to fall short of last season by 2,343,000 bales, and takings by American mills for the season would have to fall short by 1,000,000 bales.

These developments in the future will likely be disclosed by developments in the world's visible supply of American, week by week, eventually probably proving a revelation.

New Service Thread Guard Caster.

In order to eliminate friction on their casters, the Service Caster & Truck Company, Albion, Michigan, announce they have perfected and patented designs incorporating Timken and Hyatt bearings at every point of contact. The yoke, top plate and wheel have been designed to withstand maximum strain; to insure lubrication, many of the models are Alemited. The company has also developed a thread proof caster for use in industrial plants, which is designed to prevent fibers, threads, rags, etc., from winding around the caster axles. There is no opening at the top of the shield, and a guard at the bottom of the yoke is designed to prevent strings and thread from winding around the axles. It is stated that this thread guard feature can be furnished on most types of Service casters.

National Adds Three Fast Colors.

National Aniline & Chemical Co., Inc., 40 Rector St., New York City, announces three new fast colors—National Carbanthrene Blue GCD Double Paste, National Carbanthrene Yellow G Double Paste, and National Carbanthrene Black B Double Paste. They are all readily reduced and dissolved with caustic soda and hydrosulphite, it is stated, and are suitable for application on rayon and cotton in all types of machines.

TEXACO—for Dependable and Economical Lubrication—TEXACO

[*As Power Savers*]

TEXACO Spindle Oils

These Textile Lubricants *are highly endorsed*

You may consider price—and you will; you will consider body (and you should); and of course you must consider purity—for it means the elimination of oil stains.

But the greatest economy, from the standpoint of parts, replacements and ultimate cost of the finished textile depends on the use of an oil which permits the most efficient operation of *the greatest number of spindles per horse power.*

Such Oils Are TEXACO SPINDLE OILS.

Our lubricating engineers have in many, many cases effected unbelievably notable reductions in power consumption by the application of TEXACO SPINDLE OILS to spinning frames in textile mills throughout the country.

It is for this reason undoubtedly, more than for any other reason, that TEXACO SPINDLE OILS are so highly endorsed by lubrication Engineers in the textile industry.

We are ready to demonstrate how TEXACO SPINDLE OILS will improve machinery operation, increase production, and decrease power and oil consumption throughout your plant—regardless of the type, age or condition of the equipment under your supervision.

Start improving spindle operation and decreasing power consumption by calling on us today.

Other TEXACO Textile Mill Specialties are:

TEXACO LOOM OILS
TEXACO TOP ROLL LUBRICANTS
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OFFICES IN PRINCIPAL CITIES

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

J. R. WIKLE, for several years manager and superintendent of the Ella Division, Consolidated Textile Corporation, Shelby, N. C., has become manager of the Magnolia Cotton Mills, Magnolia, Ark., which is being placed in operation. Mr. Wikle is succeeded at the Ella Division of Consolidated by W. J. Erwin, who for a number of years has been connected with the corporation's plant at Lynchburg, Va.

DONALD COMER has been made president of the Avondale Mills, with headquarters in Birmingham, Ala., succeeding his father, the late Governor B. B. Comer.

A. W. GREER, overseer at the Highland Mills, Griffin, Ga., died on November 7th at his home. He is survived by several children, among them being James A. Greer, of the American Wool & Cotton Reporter, Greenville, S. C.

EDWARD POPE, a member of the firm of Stodghill & Company, Atlanta, Ga., and a son of J. W. Pope, representative of the A. E. Staley Mfg. Company, met with instant death in an automobile accident near Biloxi, Miss., on Tuesday, November 1st.

W. G. REYNOLDS, who recently resigned as superintendent of the Eastern Manufacturing Co., Selma, N. C., has been made manager of the Arcadia Mills, Ronda, N. C., formerly the Ronda Cotton Mills.

J. R. KILLIAN has resigned as superintendent of the Beaver Mills, North Adams, Mass., and has located in Columbus, Ga., where he has acquired an interest in the Georgia Webbing & Tape Company.

BRUCE HAGOOD has been elected president and treasurer of the Glenwood Cotton Mills, Easley, S. C., succeeding his father, the late W. M. Hagood, Jr.

J. B. WINGARD has been promoted to overseer of twisting and weaving at the Southern Brighton Mills, Shannon, Ga., succeeding J. F. Wright, who resigned to become superintendent of the Millen Mills, at Millen, Ga.

STANLEY W. CONVERSE has been promoted to general superintendent of the Clifton Manufacturing Company, Clifton, S. C., succeeding L. L. Brown, resigned. T. C. Drew, Jr., has been promoted from night superintendent to superintendent. Hunter West, formerly night overseer of weaving, is now night superintendent of Mill No. 3.

G. E. SELLERS is now day overseer of weaving at the Irene Mills, Gaffney, S. C.

A. F. BRUTON has resigned as president and treasurer of the Cascade Mills, Mooresville, N. C., and will devote his time to the Curry-Conrad Mfg. Co., of Mooresville, manufacturers of dress shirts, being president of this organization.

A. H. THOMAS has accepted a position with the Fort Mill Manufacturing Co., Fort Mill, S. C.

A. W. CHAPIN has been made manager of the Phoenix Mills, Inc., at Statesville, N. C. He was formerly with the Melrose Knitting Mills, at Raleigh, N. C. E. E. Chapin has been made assistant manager at the Phoenix mill.

J. W. SWINNEY has been awarded the scholarship of the Cotton Manufacturers' Association of Georgia at the Georgia School of Technology, Atlanta, Ga., where he is now a junior in the textile department.

W. C. TAYLOR has resigned as overseer of weaving at the Irene Mills, Gaffney, S. C.

W. F. SMITH is now overseer of carding and spinning at the Mexia Textile Mills, Mexia, Texas. He has for some time been general overseer of spinning at the Loray Division, Manville-Jenckes Co., Gastonia, N. C.

H. A. BARNES, superintendent of the Proximity Print Works, Greensboro, N. C., was elected chairman of the Piedmont section of the American Association of Textile Colorists and Chemists, at their meeting in Charlotte in October.

HARRY E. MATTHEWS has been appointed manager of the Charlotte office of the Morse Chain Company. The managership of the Charlotte office became vacant with the death of George W. Pritchett, which occurred on September 15th. Mr. Pritchett had been manager of the Charlotte office since its opening and was well known throughout the South. Mr. Matthews has been assistant manager of the Charlotte office for a number of years, and is, therefore, well equipped to take over the responsibility of this office.

W. C. DODSON, southern representative for Smith, Drum & Company, met with a serious automobile accident in the neighborhood of King's Mountain, N. C., on Friday, November 4th. Mr. Dodson was at the time attending to business for his company. One of his legs was broken and a foot crushed, and it is doubtful whether he will be able to call on the trade again for at least three months from the date of the accident. His residence address is 49 Hermitage Court, Charlotte, N. C.

New Model K Cyclone Hoist.

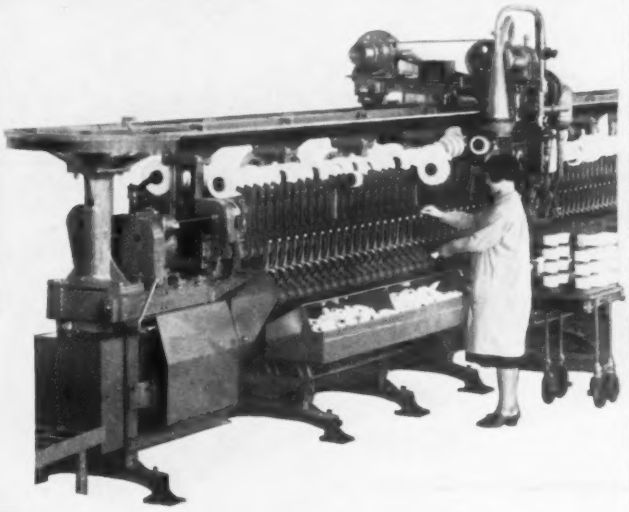
The Chisholm-Moore Mfg. Co., Cleveland, Ohio, have developed a new light-weight high speed chain hoist, known as the new Model K Cyclone Hoist, which has a number of new features resulting from the company's extended experience in the manufacture of these products. It is constructed on the gyrating yoke principle as was the former model. One of the improvements is the use of anti-friction bearings at all rotating points. Eight ball bearings, four roller bearings and one Timken thrust roller bearing in the lower swivel hook are used to increase the efficiency. The four eccentric roller bearings are built in one complete unit, eliminating the loose rollers in previous models. A newly developed steel alloy, of an especially hard character, and giving clean and accurate chain pockets, is announced by the manufacturers as another improvement. All parts are interchangeable. The entire mechanism is enclosed in a dust-proof, oil-tight frame, and it is stated the hoist needs to be packed with grease only once a year under ordinary usage. A light weight is secured by a more logical distribution of the materials used in the construction, it is explained.

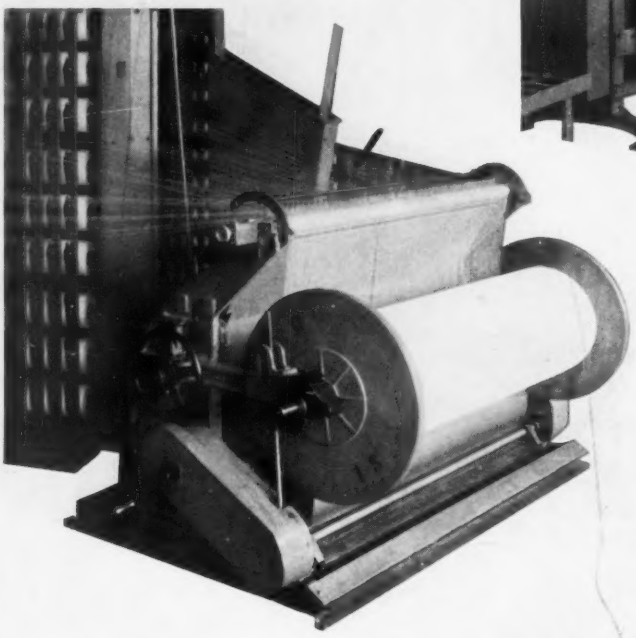
AUTOMATIC SPOOLER

Spooling Speed—*1200 Yards per Minute*

Air friction furnishes the spooling tension—necessarily low and uniform, retaining the original elasticity in the yarn. The Weaver's Knot causes less trouble in the processes which follow spooling.

Result—better product and greater production at lower cost.





HIGH SPEED WARPER

Warping Speed—*500 to 600 Yards per Minute*

Twenty minutes or less is the time two operators usually require for creeling a Barber-Colman High Speed Warper—twenty minutes from the time one beam is finished until the next is ready to start. Compare this with the time required by the method now commonly used.

On November 1, 1927—56 representative Cotton Mills were using or had on order:

243 Automatic Spoolers
186 High Speed Warpers

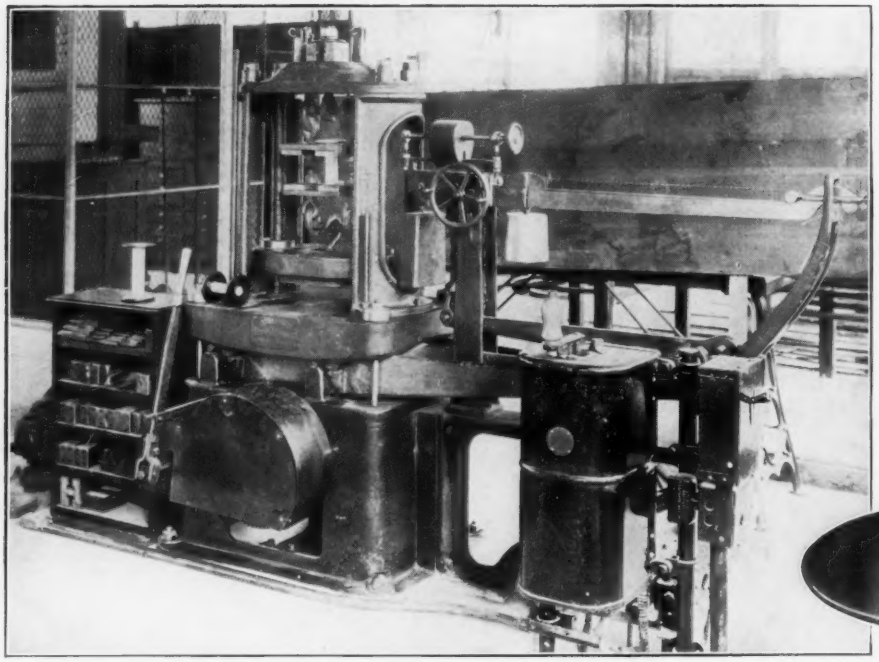
This equipment will improve conditions in your mill

BARBER-COLMAN COMPANY

GENERAL OFFICES AND PLANT

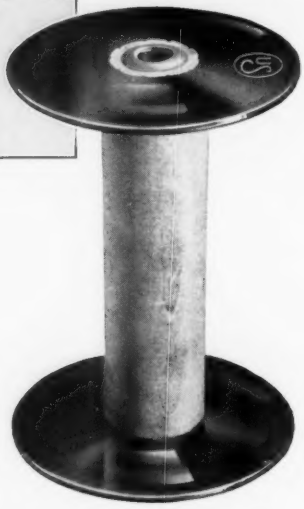
ROCKFORD, ILL., U. S. A.

FRAMINGHAM, MASS. GREENVILLE, S. C.



The Testing Machine at Brown University

that told the story of the strongest construction. U S Vulcanized Fibre Head Spools withstood 1200 to 1400 pounds' pull before the heads came loose from the barrel. This is 200 to 400 pounds above the breaking point of all other constructions similarly tested.



A Real Reason for U S Fibre Head Spools

They Last Longer

There are lots of little reasons why you should buy U S Fibre Head Spools, but ask the man who uses them the main reason why he bought them. He will tell you, "They last longer." Nobody knows how long they will last. In the meantime what? Freedom from all the old spool troubles, waste, and cost of replacement.

U S construction in mill after mill has proved to be the best construction after all, best by test and best in practical use. The holding power of the dogwood bushings in U S Fibre Head Spools is not impaired by notching to keep the head from turning.

Heads are guaranteed not to come off, crack, or sliver in regular mill usage.

Write, wire or 'phone a U S Service man to tell you why other mill men are buying U S Fibre Head Spools and why they are BETTER.

P. S.—A U S Fibre Head Spool, 4" x 6", averages to weigh two ounces less than the same size Boynton Shield Spool.

U S BOBBIN & SHUTTLE CO.

PROVIDENCE, R. I.
GREENVILLE, S. C.

Branch Offices

HIGH POINT, N. C. PHILADELPHIA, PA. ATLANTA, GA.

U S Salesmen are specialists on bobbins, shuttles and spools. Order direct from U S for real helpful and understanding service.

Announcement

We are now Selling Agents for Apco-Mossberg Corp.

All-Steel Loom Beam Heads

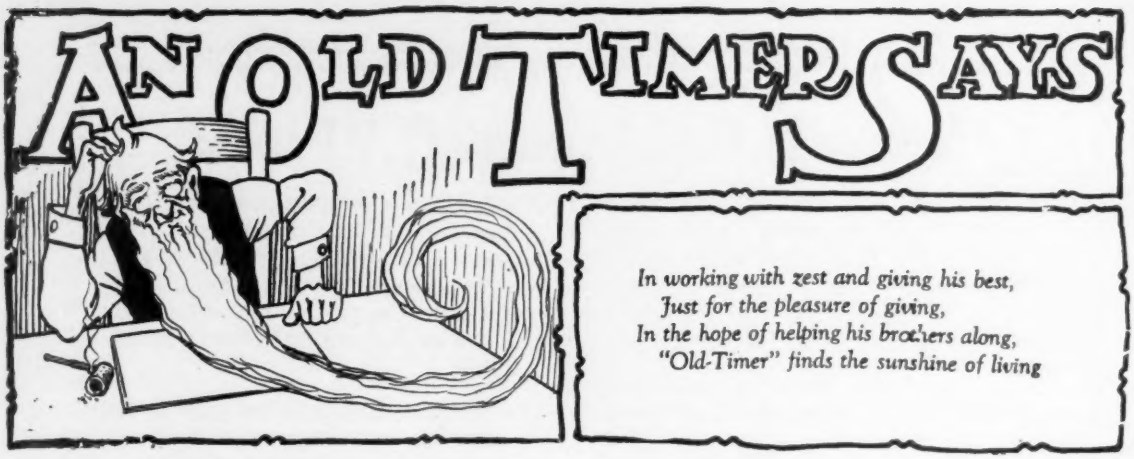
All-Steel Section Beam Heads

All-Steel Adjustable Beam Heads

All-Steel Beams

US

BUILDERS OF BETTER BOBBINS, SPOOLS, AND SHUTTLES


AN OLD TIMER SAYS
In working with zest and giving his best,
Just for the pleasure of giving,
In the hope of helping his brothers along,
"Old-Timer" finds the sunshine of living

A weaver can make about $1,000.00 per year.

A section man can make about $1,200.00 per year.

An overseer can make about $3,000.00 per year.

A superintendent can make about $4,000.00 to $10,000.00 per year.

But there is practically no limit to what a man who "thinks" can make—providing, of course, he has the determination to carry his "ideas" through to realization. The man who can "think" is the man who stands out above the others.

So confounded many of us just drift along in the same old rut we have been in for years. We do not give it a thought when Babe Ruth knocks a home run, or Lindy flies to Paris, or that fellow who used to work right in the same mill with us has got that good job.

We must realize that those fellows were right up on their toes to accomplish the dream that they had set out to do—that they had *prepared* themselves by constant application to their jobs and to hard study—that the fellow who worked in the same mill you did, did not loaf in the same barber shop you did—

Think, brother! *Think!*

Say! Do you remember that time the boss just raised the devil with you and you came very near joining the list of "resigned" in the textile papers because you went to sleep and let your pickers go to the dogs to where they would not make a decent lap?

Or

you let those grinders get your cards set seven ways for Sunday?

Or

you let the speeder hands get to making more tangled work and black roving than good roving?

Or

your weights got to where the mill was making about three numbers of yarn on each side of the standard number you were supposed to make?

Or

because you let the spindles all get out of plumb and the spinners quit picking the rolls and the doffers all lapping through piecing up so every quill would make a thin place in the cloth?

Or

when the spooler hands ran a race with each other to see who could make the most kinks and the warper hands just didn't give a damn, how they put up the ends because you hadn't paid any attention to them and the creels were all out of level with worn skewers and worn spool bushings that made the warpers stop before the girl could get the next one?

Or

when that old man would throw in "so many" buckets of starch in the size kettle and a few shovelsful of size, turn on the steam and then turn that mess into the slasher boxes as soon a the other ran out, whether it had been cooking two hours or two minutes?

Or

when you let the second hand show up all the seconds until they were double what they were when you gave it your personal attention?

Or

when you let your supply bill get so high it ran out through the top of the house and your cost was just a few jumps behind?

I say! Do you remember it?

Well,what I am trying to say is that just as sure as death and taxes that time is creeping up behind you again unless you are keeping a systematic check on your work—unless you are profiting by your past experience. If you are just drifting along because she is running good, look out. The boss will come drifting in some of these fine mornings and if he raised hell before—

I'll leave you to finish the sentence or get busy, just whichever you darn please.

* * *

Education is not learning things by rote—it is not remembering a lot of rules like most young fellows think it is. Education is simply understanding. When you understand anything you have learned it for all time to come.

* * *

When your job is in a mess and you put your shoulder to the wheel and get it on top—

When you can realize you have done wrong and can be man enough to make it right—

When you can make up your mind to improve your education and do not quit after a few weeks, but keep at it—

When you can see an opportunity and take advantage of it to make your job run better or lower your cost—

Send Old Timer your address. He knows hundreds of mill executives who would like to meet you.

"How's Business?" "Fine!"

Since men first bartered the work of their hands for profit these three words have been their greeting and its answer. Pride and the desire to create the impression of success is just as human today as ever.

In the effort of Modern Accountancy to extend its service more fully in the interest of better business, this pride in the possession of something, known by all business men to be desirable, is apparent.

Often business executives will say, "Oh yes, we have a Budget"—it's good business to have a Budget. Yet a real Budget is as unknown to them as success was to the ragged ancient trader who always answered "Fine!", to the greeting.

The Budget, in its fullest service, is an absolute necessity today if better business is the aim; or if the old greeting, "How's Business?", is to be answered in truth, "Fine!".

ERNST & ERNST

ACCOUNTANTS AND AUDITORS—SYSTEM SERVICE

NEW YORK	WASHINGTON	DETROIT	CLEVELAND	CINCINNATI	ST. LOUIS	CHICAGO	DALLAS
PHILADELPHIA	BUFFALO	GRAND RAPIDS	AKRON	DAYTON	KANSAS CITY	MILWAUKEE	FORT WORTH
BOSTON	ROCHESTER	KALAMAZOO	CANTON	LOUISVILLE	OMAHA	MINNEAPOLIS	HOUSTON
PROVIDENCE	PITTSBURGH	ATLANTA	COLUMBUS	HUNTINGTON	MEMPHIS	ST. PAUL	SAN ANTONIO
BALTIMORE	WHEELING	MIAMI	YOUNGSTOWN	NEW ORLEANS	DAVENPORT	INDIANAPOLIS	WACO
RICHMOND	ERIE	TAMPA	TOLEDO	JACKSON	DENVER	FORT WAYNE	SAN FRANCISCO
WINSTON-SALEM							LOS ANGELES

ALL KINDS OF
RUBBER COVERED ROLLS
Stowe & Woodward Company

Newton Upper Falls, Mass., U. S. A.

STODGHILL & COMPANY

510 Stewart Ave., S. W., Atlanta, Ga.

"The Size That Satisfies"

STODGHILL & COMPANY bbl. No. SIZING COMP'D GROSS 585 TARE 70 NET 515 ATLANTA, GA.

Sizing Compound "V" — TALLOW, GLYCERINE, GUMS, DEXTRINE, PRESERVATIVE, WATER

Contains no Chlorides, no Mineral Salts, and no Mineral Oil.

Sizing gums and weighting gums. . . .

Our prices are right for the quality of products.

STODGHILL & COMPANY bbl. No. EMULSO TALLOW GROSS 550 TARE 60 NET 490 ATLANTA, GA.

Emulso Tallow — TALLOW, WATER

The perfectly emulsified product. Contains no Gums, Acids or Alkali.

HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

A Rayon Weaving Problem.

EDITOR COTTON:

I would like to secure some information from some of your readers as to what is the cause of uneven lines in a woven fabric made of rayon, commonly known as shiners. The enclosed sample shows the difficulty. It is made of cotton warp and rayon filling, with streaks filling-ways of the cloth, these streaks being solid for a number of inches lengthways.

The thing I am most interested in is whether this is caused by the kind of rayon used, the treatment given it, or whether it might be the result of poor winding. We have many complaints from customers in reference to uneven lines or streaks, and will appreciate receiving any information that might assist us in overcoming this trouble.

I. M. (PA.)

Comparison of Yarn Strength from Back and Front Fly Frame Bobbins.

EDITOR COTTON:

There are a great many malpractices in the manufacture of yarn which are so old that many of us are given to accept them with a resigning shrug of the shoulders. For the sake of production, and good production is certainly required for profits, we push our stock through process after process at speeds which cannot make even, strong yarns. The unevenness we hope to hide by doubling, so that the thick and thin places will fall together and the resulting average be acceptable. It is this willingness to accept the average, to be guided by the general result and not the particular, that, to my mind, has done so much to hold back the improvement so needed in cotton yarn manufacture.

The process to which I wish to direct attention is the fly frame. The particular feature about the fly frame which I believe causes so much of our trouble has no doubt been noticed by mill men many times. For this reason it is mentioned with hesitancy now, but it is mentioned because the writer has never seen the subject treated and because he sincerely believes it causes trouble.

Spinning frame rolls are set at an angle to the horizontal so that the twist will go right up to the bite of the front rolls, thus preventing stretching of the drafted roving as it comes from the rolls. Fly frame rolls, on the other hand, are run horizontally on the frame, so that the drafted roving must traverse a part of the arc of the bottom front roll before it receives any twist. The same tension must exist at this point as elsewhere from the top of the flyer to the rolls; if there is any reason this is not true, it is not perceptible to the writer at this time.

Due to the fact that there are two rows of spindles on the fly frame the roving leaves the rolls at different angles. The roving which is delivered to the back row makes a greater angle than that going to the front, and consequently must traverse a greater a distance on the front roll before any twist is imparted to it. This, therefore, gives us the opportunity of testing the roving which has undergone the stretching to a difference of degree, the front receiving the twist nearer the bite of the rolls and being stretched the less.

The following figures represent the test of thirty bobbins of 40s single yarn, one set being run entirely from roving taken from the back row of a fly frame and the other from the front row. The roving bobbins were taken from one doff of a fly frame and were consequently run side by side through the same rolls, from the same stock, etc. The roving is 7.7 hank, the draft on the spinning 10.5. Length of cotton 1⅛ inch.

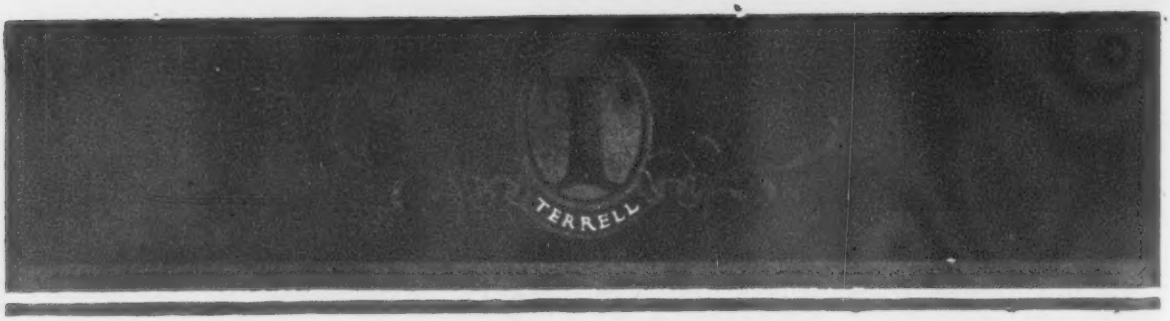
BOBBINS FROM FRONT ROW ROVING				BOBBINS FROM BACK ROW ROVING			
Weight	Break	Weight	Break	Weight	Break	Weight	Break
25	47	23.5	40	24.5	46	24.5	40
25.5	52	23.5	42	24	45	24.5	41
24.5	47	24.5	46	24	42	24	39
25	47	24	44	24.5	42	23.5	39
24.5	48	24.5	40	24	42	25	45
25.5	51	25	46	24.5	38	23.5	38
24	45	24.5	43	25.5	50	24.5	45
25	47			25	45		
Avg. weight 24.57		Break 45.3		Avg. weight 24.37		Break 42.5	

The finer the work the greater, it seems to me, the difference would be. Someone may say that the back row of ends runs tighter than the front, but this is only further argument that the roving should be twisted at the bite of the rolls. The front line has greater length over which its tension is distributed, and has not as great an angle at the rolls.

The only way to establish the truth or falsity of this contention is by a series of tests and a record of these will be appreciated.

Also, the writer has never been able to get a uniform tension throughout the doff. Immediately after doffing the ends are too tight, gradually getting to the proper tension after several layers have been run on the bobbin. Setting of the cone belt at different places on the cone when starting up on the empty bobbin and changing of tension gears to make up for the difference has not produced the desired result. Does everyone have this trouble and are we accepting it and making the best of it we can, or am I in a class by myself? If the former be true a great deal of experimenting in cotton yarn manufacture should be done and some changes made; if the latter, will some one have the kindness to advise me?

D. W. (N. C.)



Worn-out machinery has no place in the modern mill. Neither have worn-out methods. If you are still cleaning bobbins by hand . . . or by any other method than the Termaco way . . . you need to investigate at once.

Strong statement? Yes—but the proofs are ready and waiting. Plenty to convince any open minded mill executive that great economy and a remarkable increase of plant efficiency is *certain* to follow the installation of Termaco Bobbin Cleaners.

130% up to 314% of their cost saved yearly. That is their record —as determined by an unbiased, independent investigation agency.

If you don't have Termacos now, you undoubtedly will have them later. NOW is the time to get the full data on this machine and what it means in economy and efficiency. Complete information gladly sent upon request. Write for it.

The TERRELL MACHINE CO. Inc.
Mfrs. Termaco, Utsman, Type K, Etc. Machines
CHARLOTTE, N.C.

General Supply Co. Danielson, Conn.
N.Y. and N.E. Representative.

Doubling and Drafting Carded Yarn.

EDITOR COTTON:

"C.C.(Mass.)" makes a very interesting line of calculations in his "Doubling and Drafting Carded Yarn", appearing in July COTTON. I wonder if he attended the New Bedford Textile School.

The art of doubling and drafting is undoubtedly the most important factor in the operation of a cotton yarn mill, as "C.C." states, but I find in actual practice that the doubling and drafting must be molded to fit the equipment at hand and will not always line up as nicely as a list of carefully prepared calculations such as the one he presents.

For example, in fitting the lay-out as he gave it for 30s/1 yarn to my equipment, I find: 6,272 spindles on 30s/1, front roll 144 r.p.m., 120 hours, will produce about

$$6{,}272 \times .270 \times 12 = 20{,}320 \text{ pounds,}$$

using the Saco-Lowell production table.

While 1,056 roving spindles on 5.9633 (let's be practical and call it 6.00-hank) will produce, with 6.00-hank, 2.41 turns per inch, 1,300 r.p.m. spindle speed, 128 r.p.m. front roll:

$$1{,}056 \times 1.28 \times 12 = 16{,}220 \text{ pounds.}$$

I am thus short 4,100 pounds of roving with this layout. What is to be done about it? Since the capacity of the spinning room is 20,320 pounds, the card room must be laid out to furnish this amount of roving. So our nice line of calculations is knocked out and we must start all over again.

"C.C.'s" method is all right when planning the machinery for a new mill, but unfortunately few of us have that opportunity. Here is my method for arranging the doubling and drafting and *production* of a carded yarn mill.

In a yarn mill the spinning production is the life of the plant. Pounds lost by idle spindles or excessive stoppage can be made by no other machine. The card room must be laid out to produce roving enough to keep every spinning spindle supplied. Let us take then the small yarn mill equipment and lay it out for 30s/1 yarn of medium quality.

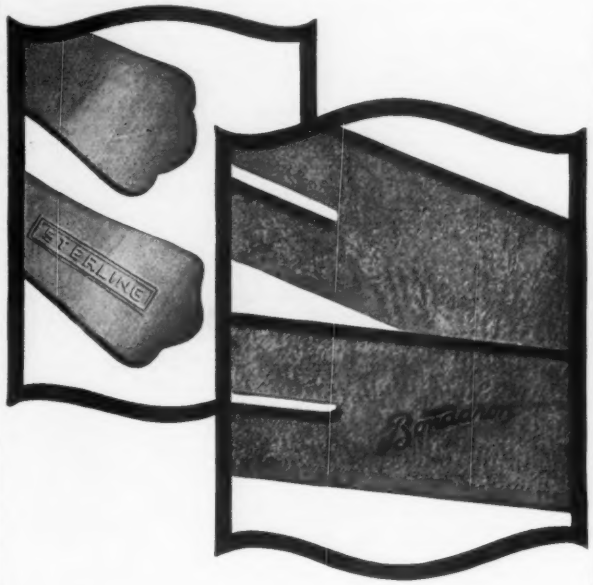
The 6,272 spindles will produce 20,320 pounds of yarn as calculated. Spinning drafts with double roving should be between 8 and 10, but can be stretched to 11 if necessary and are frequently found at 12. The roving then must be between 5.50-hank and 7.50-hank, preferably 6.00-hank.

$$30 \times 2 \div 11 = 5.45\text{-hank}$$
$$30 \times 2 \div 10 = 6.00\text{-hank}$$
$$30 \times 2 \div 8 = 7.50\text{-hank}$$

Allowing one per cent return waste, our roving frames must put out 20,525 pounds. $20{,}320 \div .99 = 20{,}525$. There are 1,056 spindles, 6×3 flyers, at 1,300 r.p.m. Our cotton will require 1.20 as a twist multiplier. 6.00-hank roving figures 16,220 pounds, as indicated. There are three ways to increase this amount: Heavy up the roving, speed up the frames, or both. First, going the limit on heavying up the roving, 5.50-hank gives a front roll speed of 131 r.p.m.

$$1{,}056 \times 1.40 \times 12 = 17{,}750 \text{ pounds.}$$

Still not enough, but our spinning draft is already as long as we want to use— $30 \times 2 \div 5.5 = 10.9$. The frames must be speeded up. $20{,}525 - 17{,}750 = 2{,}775$, which is a difference of 15.6 per cent. Then 1,540 r.p.m., would be required on the spindles:



They May Look Alike— But the Difference is Vast

Leaving the hair on an ordinary check strap doesn't any more make it a *Bondaron Check Strap* than the addition of a suit of clothes makes a man out of a monkey. Without the mark "Sterling" to guide them, the purchasers of silverware would be unable to distinguish the unreal from the genuine.

Plated silver looks so much like sterling silver that from the standpoint of the *appearance* there seems little to choose between them. Ordinary check straps with the hair on so closely resemble the product bearing the name "Bondaron" that to the eye one check strap may *seem* to be as good as another.

But appearances are deceiving—"all is not gold that glitters"—and the army of "just as good" merchants leaves nothing but dissatisfaction in its train. When a jewelry clerk shows you silverware you look for the name "Sterling" before you buy. When a mill supply man offers you check straps insist on seeing the name Bondaron. Unless the name is there you won't get the genuine—and if you don't get the genuine you *can't* get Bondaron service.

CHARLES Bond COMPANY

Leather Curriers and Manufacturers of Belting and Textile Leathers

617-619 Arch Street Philadelphia, Pa.

GDC

The G D C Policy..Quality First

Manufacturers who appraise quality at its proper valuation make no compromise with quality in dyestuffs.

It is our unswerving belief in the soundness of this view that has fixed the G D C excellence in dyestuffs.

The demand exists for unvarying quality in dyestuffs. That is the only demand recognized in the manufacture of G D C colors. You may use them therefore with the assurance that finishing results will be maintained at par.

230 Fifth Avenue, New York

BOSTON, MASS.
159 High Street

CHARLOTTE, N. C.
220 W. 1st Street

PROVIDENCE, R. I.
40 Fountain Street

CHICAGO, ILL.
305 W. Randolph Street

PHILADELPHIA, PA.
111 Arch Street

SAN FRANCISCO, CAL.
22 Natoma Street

GENERAL DYESTUFF CORPORATION

$$\frac{1300}{100 - 15.6} = 1{,}540 \text{ r.p.m.}$$

The range of drafts for roving frames is 5 — 7. Hence to make 5.50-hank, the intermediate roving must be between 1.60- and 2.20-hank. Medium being 1.85-hank with a draft of about 6.

$5.50 \times 2 \div 7 = 1.57$-hank
$5.50 \times 2 \div 6 = 1.85$-hank
$5.50 \times 2 \div 5 = 2.20$-hank.

There are 300 spindles on the $9 \times 4\frac{1}{2}$ intermediates, running 900 r.p.m. Will these produce the 20,900 pounds of 1.85-hank roving necessary to run and roving frames?

Using 1.20 twist multiplier again, we have a front roll speed of 148 r.p.m. giving 5.18 pounds per spindle per ten hours.

$300 \times 5.18 \times 12 = 18{,}648$ pounds.

Not enough.

$$\frac{20{,}900}{300 \times 12} = 5.80 \text{ pounds per spindle in ten hours.}$$

The table shows 1.70-hank produces 5.81 pounds per spindle per ten hours, and 1.70 is within our limits. This gives a draft of about 6.50 for our roving frames.

The intermediate draft range is 4 — 6. This gives a slubber roving range for 1.70-hank of .60-hank to .85-hank.

$1.70 \times 2 \div 6 = 567$-hank
$1.70 \times 2 \div 4 = .85$-hank

Since the 120 $11 \times 5\frac{1}{2}$ slubber spindles are ample at 650 r.p.m., let us give the intermediate the advantage of a short draft. Try 4.5, requiring .75-hank slubber roving. Using 1.00 twist multiplier, we have a front roll speed of 200 r.p.m.

$120 \times 15.78 \times 12 = 22{,}723$ pounds.

With plenty of drawing equipment, we can draft short again on the slubbers. Range 3 — 5. Try 4. This will require:

$.75 \div 4 = .1875$-hank drawing sliver.

$8.333 \div .1875 = 44.5$-grain finish drawing sliver.

Eighteen deliveries at 275 r.p.m., 1 3/8-inch leather top rolls, will produce $105 \times 18 \times 12 = 22{,}680$ pounds, which is all right.

The drawing frame draft range, doubling 6, is 5 — 7. I believe there should be a difference of several grains between the breaker and finished drawing sliver. For if the breaker sliver weighs 50 and the finished 45, the drawing tender cannot possibly slip any braker sliver around and pass it on to the slubbers, for the larger slubber roving resulting would easily be caught. If both breaker and finisher sliver weigh the same, a lazy drawing tender can easily slip around a few cans now and then and save himself some work at a great sacrifice to quality.

A finished drawing sliver, then, of 44.5 grains per per yard, with a draft of 6.55, will require a breaker sliver of 48.5, giving a breaker drawing production of $113 \times 18 \times 12 = 24{,}408$ pounds.

A breaker drawing draft of 6.55 requires a card sliver 53 grains per yard, card draft of 101, waste 6 per cent.

$$\frac{53 \times 101}{.94} = 5{,}680 \text{ grains per yard picker lap.}$$

$5{,}680 \div 437.5 = 13$ ounces per yard picker lap.

Production of 17 cards, 53-grain sliver, doffer 10 r.p.m., gives $116 \times 17 \times 12 = 23{,}700$ pounds.

This is carding 11.6 pounds per card hour, but lack of enough cards makes this necessary to get the production required without too heavy a sliver.

Comparing the lay-out of "C.C." to this one, we have the following table:

COMPARATIVE TABLE.

	C. C. (Mass.)				New Lay-Out.			
	Size	Draft	Speed	Prod.	Size	Draft	Speed	Prod.
Picker Lap	12-oz.	.....	.....	.....	13-oz.	.....	.....	.....
Cards	49.35	100	10½	23,300	53	101	10	23,700
Br. Drawing	50	6	275	25,300	48.5	6.55	275	24.408
Fin. Drawing	50	6	275	25,300	44.5	6.55	275	22,680
Slubber	.61957	3.71	216 650	28,800	.75	4	200 650	22,723
Intermediate	1.7038	5.5	155 900	20,900	1.70	4.50	155 900	20,900
Roving	5.9633	7	152 1540	19,200	5.50	6.50	155 1540	20,525
Spinning	29.81 6s	10	144	20,320	30s	10.90	144	20,320
Total Draft	5,142,060				Total Draft			5,526,069

This table shows two lay-outs for producing 30s/1 yarn. The one according to the figures of "C. C. (Mass.)" in the July issue of COTTON; the other on the basis of the method used in the accompanying article. It will be noted that in the method of "C. C.," the roving frame production drops to 19,200 pounds, while on the other table it is 20,525—sufficient for the spinning production, as explained in the article herewith.

The advantage of laying out the mill by this method is that when it is finished, both the drafts and speeds are as favorable to quality and production, as the equipment will allow.

CONTRIBUTOR No. 801.

Stay Finishes and Finishing in Range.

EDITOR COTTON:

We are finishing some stay finishes, one a 38½-inch, 8.20-yard, and the other a 40-inch, 5.50-yard sheeting, gray. The enclosed samples show these.

These finishes were obtained on a starch mangle consisting of two maple rolls and directly into the tenter frame, not touching the drying cans in front of the frame. The formula was as follows:

150 gallon mix.
150 pounds corn starch.
150 pounds potato starch.
3 cans china clay.
10 cans lime.

The second run is with the same machine. The material is processed in this manner in order to avoid plucking on cans and cloth.

(I might say with reference to the quantities of china clay and lime, we handle or measure this as follows: I put 500 pounds of domestic china clay in a 150 gallon agitator, dissolved thoroughly before using in the final mix, five gallons to the can. I put the sulphate of lime moulding plaster, lime, 250 pounds in a 150 gallon agitator where it is dissolved thoroughly before using in the final batch. One can as referred to, contains five gallons; therefore one can as referred to would contain approximately 16.66 pounds of clay. One can would acutally contain 8.33 pounds of lime).

What I am trying to get is this same finish on a starch mangle which has a brass roll on the bottom and a hard rubber roll on top and then go directly on drying cans in range form, without having trouble from starch plucking on cans and cloth.

The formula last used and causing plucking follows:

150 gallon mix.

150 pounds corn starch.
2 cans clay.
8 cans lime.
3 pounds paraffin wax (scale).
3 pounds borax.

The second run is with the same mix on the same machine. This formula plucks on the cans and cloth. I would be glad to have the opinions of some of your readers as to the reasons.

I am also experiencing considerable difficulty on finishing 37-inch, 2.75 and 2.25-yard drills, gray, on a Tommy Dodd that has a rubber roll of medium density and a doctor blade that is stationary; in other words, the blade does not oscillate from left to right. The cloth is run directly onto the cans from the backfiller. The material wrinkles on the Tommy Dodd roll before going under the doctor blade which causes skips and creases. A severe tension is required in front of the Tommy Dodd to eliminate these wrinkles. I wonder if this should be attributed to the density of the rubber roll, the doctor blade not oscillating, or the goods being run in range form.

I shall appreciate any information and suggestions your readers can give me on these points.

CONTRIBUTOR NO. 3016.

Size Formulae.

EDITOR COTTON:

I will give you below my size formula for slashing a warp of 60s combed peeler, 96-sley. This is in response to the question of "Contributor No. 2622" who asked in the August issue for a formula, using gum tragasol for sizing this warp, starting with 90 gallons of water, using potato starch; and giving information as to the time and method of cooking.

For this warp, I would use the following materials and method:

80 gallons of water; 130 pounds potato starch; 16 pounds gum tragasol and 4 pounds of pure beef tallow. I would plan to get a size mix of 120 gallons and start off with 80 gallons of water, to which I would add 130 pounds of potato starch. My method from this point is as follows:

Stir this for 10 minutes in cool water and add the 16 pounds of gum tragasol and the 4 pounds of pure beef tallow. Then crack the steam valve and allow the mixture to warm for 20 minutes, after which open the steam valve and boil for 45 minutes to 50 minutes.

Now cut the steam off and measure for 120 gallons. Add the necessary water to bring the quantity up to 120 gallons, turn the steam on and cook again for 15 minutes, stirring thoroughly.

As there is no way of telling how wet or how dry the steam being used is, it is necessary to start off with a smaller quantity of water than is required when the mix is complete.

Transfer the size now to the starch kettle with closed coils. Here the size should be kept at between 120 and 130 degrees Fahrenheit. When it has been drawn down to the size box, it should be kept as near as possible to 180 degrees Fahrenheit.

S.B.(S.C.)

EDITOR COTTON:

We notice that "Contributor No. 2622" would like a size formula to be used on a warp of 60s/1 C.P., for 96 sley and 104 pick, the filling to be one end of 22/26 Canton silk. He mentions the use of gum tragasol. The writer has not had experience in using gum tragasol in size mixtures, but we are giving the formula which we have used this class of work with reasonable success. The formula is:

100 gallons of water
150 pounds potato starch
14 pounds Pearl size
8 pounds beef tallow
8 pounds Japan wax
2 pounds powdered gum.

Our procedure is to start with about 80 gallons of cold water, to which is added the 150 pounds of potato starch. After this has been mixed thoroughly, cold, the rest of the ingredients are added and the steam valve is then cracked and the mixture brought to a boil slowly. This generally requires about 20 minutes. After coming to a boil, the size is then cooked for two hours. I realize that this length of cooking is contrary to the practice of most mills, and that it is contrary to theories as advanced by most sizing experts. The writer has talked to several men recently who are experienced in this class of work, and he has found that in general the practice is to cook this size for about two hours. After the size is cooked, the water is then added to bring the mixture up to 100 gallons, if necessary.

We use this as a stock mixture, and if the warps seem to be sized too heavily, the mixture is lightened by adding water. In a mill making a great many varieties of fabrics and with different constructions, it is of course necessary to have different percentages of size mixtures, and it has been our custom to have a stock mixture to use on the heaviest warps and to lighten this mixture with water for the lighter constructions. For a construction 96 x 104, however, I do not believe the mixture as given would be too heavy.

CONTRIBUTOR NO. 804.

EDITOR COTTON:

In the August issue, "Contributor No. 2622" requested information for a size formula for a 60s combed peeler warp, using gum tragasol and potato starch, starting with 90 gallons of water. He said he is getting fairly good results, but wishes to improve them if possible. With a more detailed account of just how he makes his size now, together with his steam conditions and slasher roll equipment, we might be able to judge fairly well as to whether he is really getting the results he should get.

It seems to be the prevailing idea that a size formula is all that is required. A sizing formula, to my mind, is simply a safe starting place; then we should use our judgment as to whether or not it must be weaker or stronger, but anyway, we have a solid foundation to commence operations, no matter how hard a weave it is.

The experienced man cannot be easily fooled when weaves of this kind come along. He simply "tightens up", falls back on the fundamental rule of one pound of starch to one gallon of water, adds the gum tragasol and softener in the correct proportions, and is careful, if potato starch is used, that the size is not cooked over thirty minutes, looks over his slasher size rolls, and is then "all set."

It might be interesting to the men interested to look over the following formula on about the same kind of weave, as used in New Bedford: Starting off with 100 gallons of water, 100 pounds of potato starch is mixed in and

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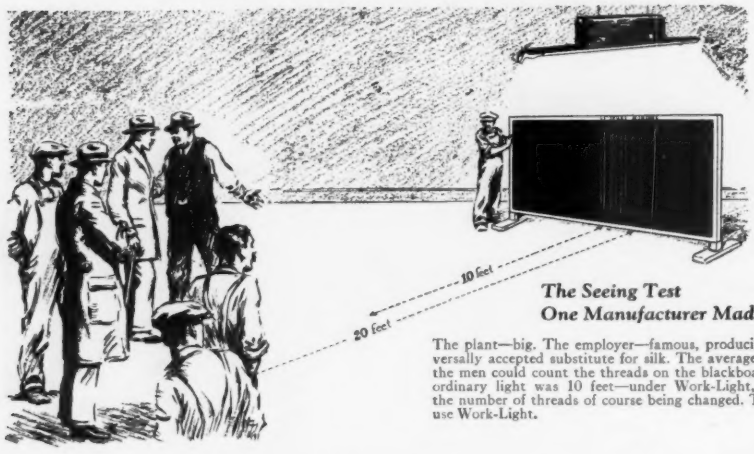

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allowed to agitate for 15 minutes. Then 15 pounds of gum tragasol and six pounds of a soluble softener are added after the mixture has commenced to warm up. After arriving at the boiling point, time is taken, and 30 minutes after that the size is ready for use. This is a mill where high pressure steam is used, and I might say that due consideration must be given to this steam question. If a mill had low pressure, or the vacuum system, it would be almost impossible to cook this same size in less than one to one and a half hours.

Personally, with a considerable amount of experience throughout New England, handling everything and anything, I prefer British Gum, with a slight variation in the amount of gum and softener used, but either Tragasol or British Gum is absolutely reliable and will give results. I do not know what this man is using, nor how, but if he has a mixture similar to the formula described, he is very nearly right, although in the South it might be advantageous to increase the amount of softener, *not* tallow.

S.T.H. (MASS.)

EDITOR COTTON:

In his inquiry, published in the August number of COTTON in the "How Other Men Manage" department, "Contributor No. 2622" does not state the number of harnesses, but from the data given using 60/1s C P 96 sley and 104 picks with 1/22/26 Canton, we believe this formula will be of great assistance:

Potato starch 105 pounds, Gum Tragasol 35 pounds, warp conditioner 13 pounds, water to make 90 gallons. Soak the Gum Tragasol in a portion of the water for 48 hours. Mix the starch with cold water and bring up to a boil in 20 minutes. When it begins to boil add the tragasol and the warp conditioner. Boil 50 minutes. Apply to the warps at 195 degrees Fahrenheit.

We believe the writer wishes to use the tragasol to produce a harder film on the warp and thus reduce the tendency to chafe and skid.

We have recommended the use of a warp conditioner in place of prime beef tallow. It is a sulphonated tallow and as it can be bought on a definite chemical analysis it will always be uniform in moisture content. The acidity is always low and will not affect the brass rolls of the slasher. The warp conditioners mix more uniformly and form smaller globules of fatty matter about the starch and gum. This will give the warp more flexibility and better weavings will result.

The warp conditioner will allow the size to penetrate the warp better, thus more fibers will be found and the warps will be stronger. No mention is made of weights, and it is presumed that this contributor does not desire to increase the weaving weight. C. H. (PA.)

The Fly Frame and Its Drives.

EDITOR COTTON:

A great number of practical men, even builders of fly frames, conceive the idea that the bobbins are driven from the main shaft through the compound, and that the bottom cone is simply a guide to provide for the variation of speed as the bobbins increase in diameter.

On all fly frames we have two speeds, (1) the positive speed; (2) the excess speed.

On all fly frames the bobbin is driven at the same speed, and works as one with the spindle in forming the twist. This is the positive speed. The excess speed is derived from the bottom cone and its train to the fixed gear on the driving shaft. What I wish to convey here is this, that the positive speed is completely separated from the excess speed at all times. This is what makes many mill men think that the mechanism is surrounded by a great deal of mystery. If anyone will stop and consider, that when the frame is up to speed without a cone belt, the cone will revolve in the opposite direction to that of winding on, it should be proof enough that the excess speed receives no aid whatever from the driving shaft.

The latest fly frames are forced to have a form of brake or dog to prevent what is known as cone backing. Disconnect the gear meshing with the sleeve gear, and next turn the frame by hand, and it will be seen that the differential sleeve will revolve in the opposite direction to that of winding. Why does this happen? If, as claimed by some mill men that the bottom cone is only a guide, surely it would revolve without a cone belt. Let any reader study the yarn reel. To make the reel revolve, we must turn the handle—the power.

Now consider if possible, that the handle is driven by the bottom cone. A variable speed is obtained by the gear on the stud circling the fixed gear. There is no aid from the fixed gear is there. To turn the reel the handle must be turned. The action is the same with the fixed gear on the driving shaft. To wind-on, the bottom cone must be turned. The result here is, if the frame is stopped when the bottom cone is turned to wind-on, the gear or gears in the compound will circle the fixed gear on the driving shaft. When the frame is up to speed there is the same motion, because the bottom cone drives the compound either opposite or faster than the fixed gear and the above gears circle the fixed gear on the driving shaft.

Some may ask what good it does to write such stuff when we have nothing better on the market. "Such stuff" will change the minds of many mill men, but I am aiming at the student in this article. Ask any textile school student about any compound or differential motion on fly frames and he will spring the same old stuff about the compound being a great aid to the bottom cone, but when the question is put to him concerning winding without twist, and the spindle at a stand-still, the poor fellow looks lost.

Let us consider the spindle and flyer at a stand-still and the strand or roving drawn through the flyer without twist and without breaking. How much aid would be received from the driving shaft? Every student should consider that the bottom cone is the excess speed, and with that borne in mind he will be more successful. Why? Because he will at all times give the cone belt the proper attention and keep it well dressed with the best belt dressing. He will see that all slow motions, chains and pulleys on the carriage are kept clean and oiled, for the bottom cone drives the carriage.

Dry bobbin gears, dirty bolsters, dirty bobbin or skew gears add more work on the cone belt. Set screws on the skew gears being positioned the same will cause vibration and add more work to the cone belt. The coils should be built close together by having the smallest lay gear possible, which is another aid to the cone belt.

All of the foregoing will help to hold conditions more equal and make life more worth living for the mule or ring spinner. WASH (R. I.)

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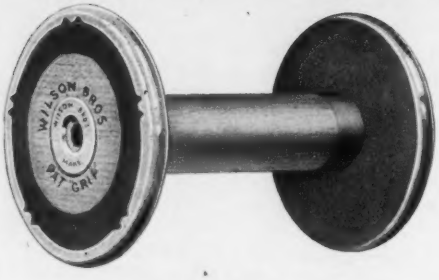

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Kinky Filling on Shade Cloth.

EDITOR COTTON:

In the August issue of COTTON "J. N. (S. C.)" states he is having quite a bit of trouble with filling kinks. He says that he has taken out all the twist he can in his filling and still have it run good, but this has not stopped the kinking on all the looms.

In the first place kinky filling is a fault of weaving much more often than it is of spinning, although too much twist is sometimes the cause. The very fact that all the looms are not kinking the filling shows us that it is a weaving difficulty.

Either a rebounding shuttle or a late closing shed will cause kinky filling. If the shuttle is rebounding the boxes will have to be tightened to stop this, although rubbing wax on the back of the shuttle will tend to stop it for a while. If the shed is closing too late the loom will have to be retimed. Any good fixer can easily do this.

If, after readjusting the shuttle boxes and retiming the loom, it is found that there is still a little kinking, I would advise putting a small bit of fur or brush in the shuttles, which will prevent the filling from being so easily pulled out of the shuttle. This will cause it to lay straighter in the shed, which will, of course, keep the filling from kinking.

I am quite sure that "J. N." will find these changes will put and end to his trouble and that he can again use his old twist in his yarn, which I would advise him to do.

L. A. S. (S. C.)

EDITOR COTTON:

Concerning the inquiry by "J. N. (S. C.)" in the August issue of COTTON on kinky filling in shade cloth, will say that the writer has had the same experience on shade cloths. This can be caused by a number of things, and I will try to describe a few of the causes.

It is assumed that "J. N." understands in reference to the power, the lining, leveling, etc., and, by the way, there is a certain shuttle eye made that will, in a sense at least, curtail the kinky filling in looms, if not practically stop it, providing everything is checked up that goes to make this kinky filling.

One main thing that we look for on our filling yarns is to see that the spinners, in putting up the ends on the filling, prepare the ends at the rollers before they catch up on the quills. This eliminates excess twist while holding the ends, as we call it, when cleaning off the laps, etc., getting ready to piece up the front quill. The reader must understand that on 41s filling there is considerable twist in the filling. In our case we have to make a 43 filling, and we put in around 28 turns per inch, though we maintain a relative humidity of about 58-60 degrees and try and have the filling moist enough to at least help in the weaving room. Then, of course, the weave room man is always guilty of keeping as much as he can get. You will notice that they are very particular not to have very many windows open. In fact, you have to insist on their opening more from time to time.

"J. N." should watch his spinners in putting up the filling ends that come down during the day and see that they are not holding the yarn too long before they make the splicing of the old and the new. It must be consid-

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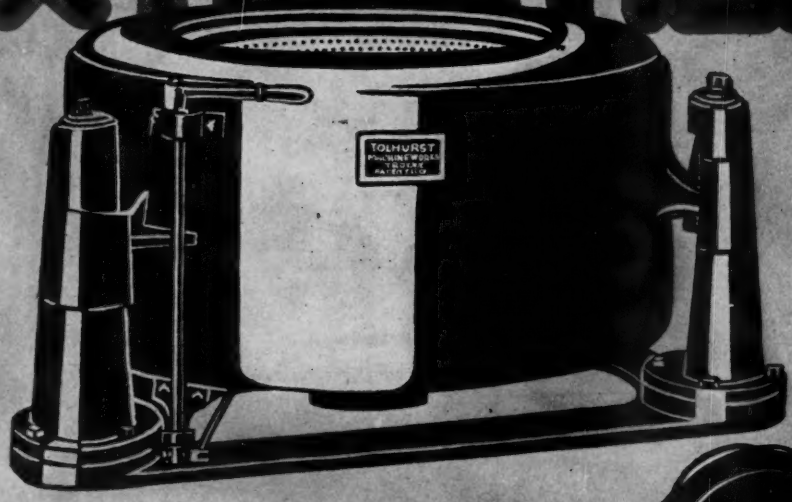

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ered what the spindle is doing while the spinner is preparing to make the piece-up. It is turning all the while, putting in 25.65 turns, or, its 28 turns per inch, and not winding up or off what it should have from the front roller. The average front roll speed on 41s or 43s is about 90 turns per minute, and the front roll is, on an average, one inch in diameter, which equals about 270 inches per minute, providing it is winding up yarn all the time. If it is not, then it is putting in excessive twist during that time it is not winding up what it is supposed to be. Under these conditions there is nothing else to expect in the weave room but kinky yarns.

Running a test on the ends down on a certain side in the filling frames, it will be noted—if it is like ours—that there will be something over 100 ends down to a side during the day. Now that is on one side. Then suppose one spinner is caring for ten sides. That's around 1,000 end piecings per day. Say that she makes a practice of holding only one half of these ends until it puts on this excessive twist, that would give 500 hard twisted places, which is very likely to show kinky on the cloth.

I will ask the reader not to run away with the idea that I am trying to excuse the carder for his thick places. This is likely to occur if he allows doublings in his piecings along the processes through the card room. That must be as carefully watched as anything else, because a thick place going through a frame that is geared up for lighter material will surely cause excessive twist. This excessive twist will show up when it gets in the spinning room. There are numerous other causes, but I'm through.

T. A. D. (GA.)

EDITOR COTTON:

I was just reading the article by "J. N. (S. C.)" on kinky filling. There are three things that he may do which will be of some help; the first is to insert about twenty turns per inch twist and if the work goes too bad reduce the spindle speed to about 7900 r.p.m. The second is to thoroughly condition his filling, by that I mean to steam it, as steam softens the yarn. The third is to insert a small piece of sheepskin with the wool on, near the eye of the shuttle, which will hold back the yarn when the shuttle hits the picker stick. Some people use flannel, but sheepskin has been found to be more effective.

I trust that these suggestions will be of some help to "J. N." B. D. (R. I.)

EDITOR COTTON:

Replying to "J. N. (S.C.)," page 1015 of the August issue of COTTON, concerning information which he desires on kinky filling with which he is having trouble on 44 x 40 shade cloth, 41/1 filling with 25.65 turns per inch, I will explain a few causes of kinky filling that will probably be of some help to him.

"J. N." did not state what staple cotton he is using. I will assume that he is using 1⅛-inch staple. 25.65 turns per inch in 41/1 filling is too much twist. He is using a twist multiplier of 4, which is a standard multiplier for warp yarn.

Using a twist multiplier of 3.5 times the square root of the count of filling, which would be 22.4 turns per inch should be sufficient unless he has short staple and bad cotton. If he has bad cotton and must use excess twist to have good running work he can eliminate kinky filling by steam-

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SPINNING FRAMES

Number Yarn	23's
Twist Square	3.00
Turns per inch	14.40
Staple	1½"
Kind	Combed Sak
Hank Roving used	1.40 Single
Draft	16.40
R.P.M. Spindle	9300
R.P.M. Front Roll	205
Weight Top Roll	1100 grs.
Average Size	23.29
Average Break	126 lbs.

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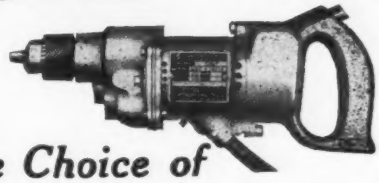

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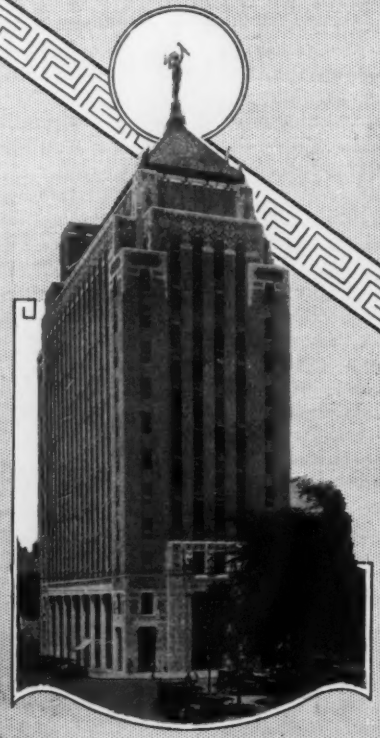

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ing the filling to set the twist before it goes to the loom, or just wet the filling an hour or so before it is put in the boxes at the loom.

As "J. N." says he does not have the same trouble on all of his looms, I am inclined to believe that part of the trouble is in the looms. I would suggest that he check the shed on the looms that are giving trouble and see if the shed is late. If the shed remains open until the shuttle is full in the box, if it rebounds any at all, the filling is free to kink, due to the late shed.

I have used the early shed to stop kinky filling on cam work, also on dobbies, with excellent results.

J. E. S. (N. C.)

EDITOR COTTON:

In response to the question of "J. N. (S. C.)," in the August issue of COTTON as to difficulty he is having with that kinky filling in shade cloth from 41s yarn, I would advise that more twist be taken out. He states that he is spinning 41s with 25.65 turns of twist. 25.65 turns for 41s figures 4.07 times the square root of the counts. This is too much.

I think for 41s filling the amount of twist put in depends on the length of the staple used. If short staple cotton is being used it will require more twist than would longer staple cotton for the same counts.

If the spinning runs too bad I would advise that new travelers be put on at least every two weeks. This will help the spinning more than any other thing which can be done.

"J. N." states that the filling kinks only on certain looms and not on others. In this case I think there is not enough tension in the shuttles on the looms that show kinks. When this is the trouble the kinks show more near the selvage of the cloth. The kinks are formed as the shuttle is driven back through the shed formed by the warp yarn.

Another way to help the spinning is to cut down the spindle speed when twist is taken out. This can be done by having larger frame pulleys to change to, without reducing the production. The roll speed can be left about the same as it was before taking out the twist.

Another way to improve the spinning is to have the spindle plumbed so that the spindle will run in the center of the rings at any part of the traverse of the ring rails.

If this contributor has his spindle plumbed, my advice would be to first go over the spindle bands, cut off the slack bands and put on new ones. It would help the spinning to go over the bands once in a while and cut off all slack bands and have new bands put on at the proper tension.

H. W. J. (MASS.)

EDITOR COTTON:

In answer to the question in reference to kinky filling in shade cloth asked by "J.N.(S.C.)", appearing in the "How Other Men Manage" section of the August number of COTTON, will say there are many causes for kinky filling. This contributor does not state the grade of cotton that he is using to make the 41s filling in which he is putting 25.65 turns of twist per inch. He mentions that he has taken out two teeth of twist, which has helped some but has not stopped all the trouble. In locating this trouble "J.N." must have the cooperation of the carder, spinner and weaver.

We all know that kinky filling is usually the result of too much twist. If the frames are band-driven they should

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all be gone over and all the slack bands cut off. Every frame should be inspected at regular intervals for slack bands, and then enough twist can be taken out so that there will be no trouble about kinks.

I have run 41s filling 1 1/16 and 1 1/8-inch stock and run it with 3.75 times the square, 24 turns per inch. I kept all slack bands cut off and had good spinning.

"J. N." also mentions that he put on a few spare hands to keep the spinning straightened up, and then took out two teeth of twist. If the spinning runs bad, cut the speeds on the frames because he has speeded the front roll by taking out the twist. Say if he took 8 per cent twist out, cut the speed the same amount. If his yarn numbers show large variations it is impossible to regulate the twist.

The filling should be thoroughly dampened, either by being steamed or having water sprinkled on it to prevent the yarn from being too lively and to allow it to run out of the shuttle too freely. More than the required length for one pick, when beaten up by the reed, will cause it to kink.

Kinky yarn is often made from dry rolls, uneven work from the card room making uneven yarn. The twist runs to the weak place and it will kink at this thin place in the yarn when weaving.

Kinky filling is also caused by the shuttle rebounding in the box enough to cause slack filling, but not enough to result in the loom banging off.

RIG. (MASS.)

Rope Splicing in the Card Room.

EDITOR COTTON:

During many years of cotton carding experience, several of which have been spent actually on the cards, I have never met a carder or grinder who knew how, or took the trouble to properly splice, or piece any of the ropes used on the cards. By the term, "properly," I mean my way, which I consider the best and only economic method of saving material, time and labor.

Having had this in mind for a long time, and being desirous to show any whom it may interest the way I used to do this job, I now intend to describe it to the best of my ability, hoping that perhaps somebody will benefit and probably realize that splicing a rope properly is an important job on the cards.

We must first understand that a rope which is pieced evenly, that is, the piecing is equal to the thickness of the rope itself, is bound to give better efficiency in every respect than a rope which has a piecing nearly half as thick again, or sometimes twice the thickness of the rope. The latter splicing, or piecing, is the wrong way, though probably the quickest, but the result is always an increase in rope waste, and more rope splicing than is necessary.

Of course the writer is aware of the fact that in some carding departments there are in use, two-strand ropes which are made to the respective sizes, and are simply connected by a hook similar to those used for round belting. Those are all right until they stretch and become too long.

However, in this article I am dealing with three-strand ropes, and the best method, as proved by experience, of splicing same.

Now let it first of all be clearly understood that all ropes should be "stretched" before measuring and "splicing." The writer used to have a few lengths tied to a heavy weight and slung over a pipe or strong hook in the wall, and let them remain there a few hours. This saves many "slack" ropes which were tight when put on their respective pulleys.

Having measured the rope to be spliced, that is the length when tight on the pulleys, plus an additional nine inches on either end for splicing (do not forget this), we are then ready to perform the real job, by following the diagrams, as I intend to convey it.

Referring to Fig. 1. We find it showing the two ends of the rope with strands separated for about eight or nine inches from the end, this being the first operation in splicing.

Proceeding, we take each of the strands as shown in Fig. 1, and split or divide every one of them into equal

FIG. 1
SHOWING STRANDS SEPARATED

FIG. 2
SHOWING METHOD OF
DIVIDING STRANDS

halves, at the same time cutting one half away from each strand as shown in Fig. 2.

The foregoing accomplished, our next stop, which must be watched very closely, is to join those strands in the proper manner previous to piecing. In Fig. 3 it will be seen that the middle strand on each end of the rope is the one coming under the other two, and this, by the way, is

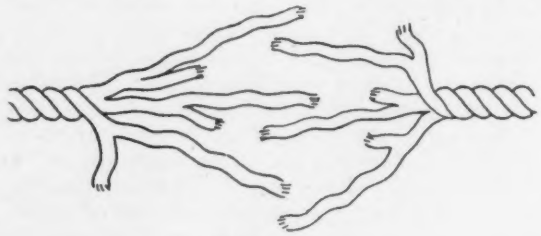
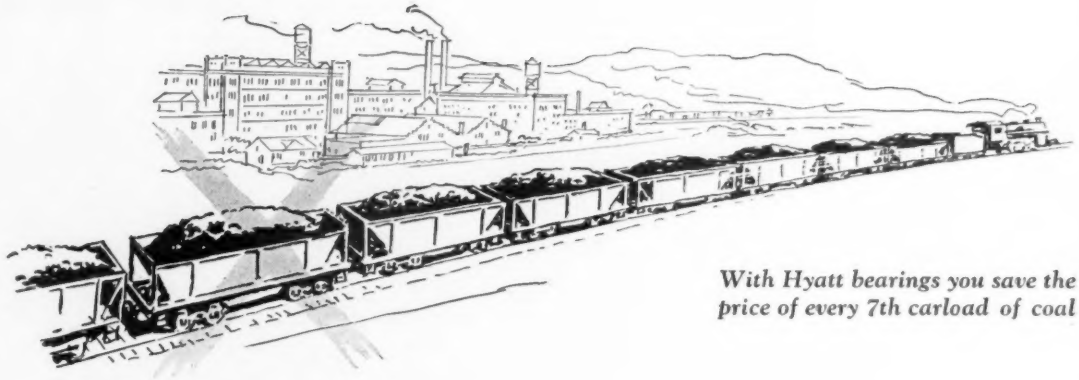


FIG. 3
SHOWING ROPE ENDS
READY FOR JOINING TOGETHER

very important and must be understood in order to be successful at the job.

Now taking hold of each end of the rope, one in each hand, and at the same time keeping the middle strand in position as stated, they are placed together with the strands side by side, as shown in Fig. 4, keeping the short ends clear. Having done this, and making sure that each strand is in position, that is, so that it can be lapped over the one belonging to the other end of the rope on its left, as will be seen in Fig. 5, we can now proceed with the piecing.



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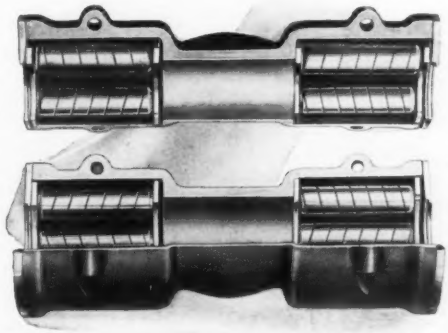

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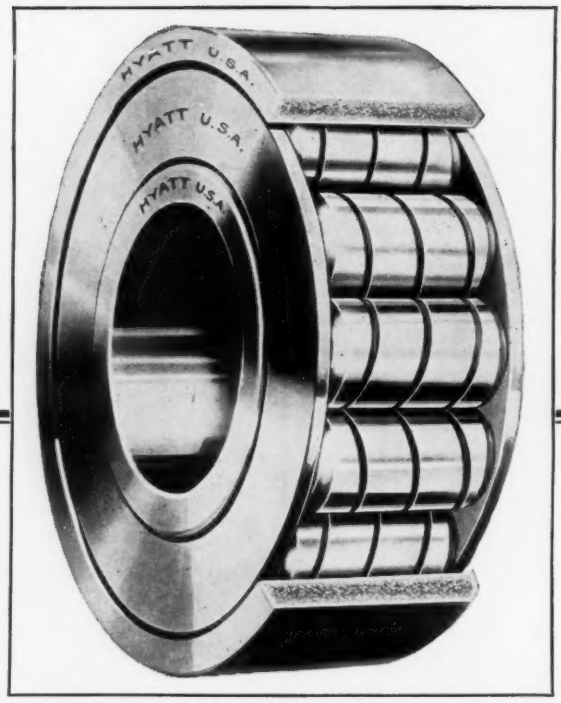

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Taking hold of the strands, and pulling them all fairly tight and evenly, we take number one strand, as in Fig. 6, and lap it over No. 2 strand, at the same time putting a little twist into the strand by twisting it between the finger and thumb of the right hand, this being the hand used for lapping, and the left hand is best for holding the rope,

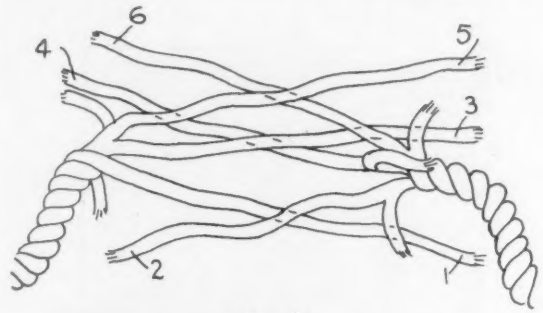

FIG. 4
SHOWING HOW STRANDS
ARE PLACED TOGETHER

the latter being, of course, attached to something to facilitate handling, as during the operation there is much pulling to be done. However, No. 1 strand being lapped over No. 2 as stated, it should be pulled up, that is, away from the body slightly and left alone.

Now we do the same thing with numbers 3 and 5

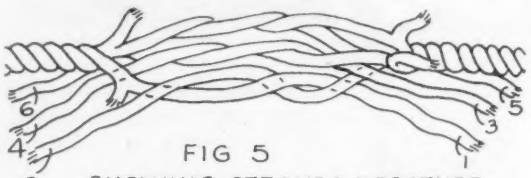

FIG 5
SHOWING STRANDS TOGETHER
READY FOR LAPPING

strands which are lapped over numbers 4 and 6 respectively. This being done, all three strands which have been lapped, namely, Nos. 1, 3 and 5, must be pulled up, away from the body, evenly, and this operation is continued until we find we have only about three inches of either

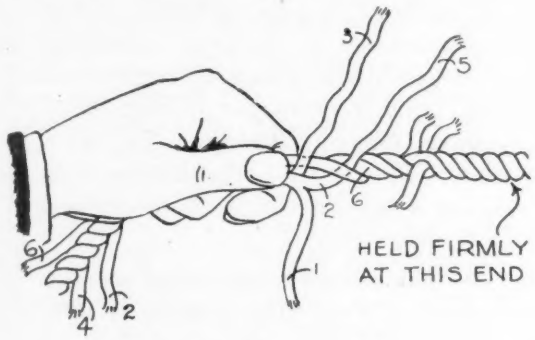

FIG 6

strands left, and this is to be used for "taking in" the remaining halves of the opposite strands, which must be unlapped during the operation of piecing.

Figure 7 illustrates the method of finishing or "taking in the ends," which is simply a dividing up of the strands in order to obtain an even piecing.

It will be noticed that the strands are again split equally, as are the ends on the opposite strands, and so strands 1, 3, and 5 are lapped or "worked in" as before evenly.

So far, we have made half the piecings, and in order to finish them it is necessary to perform the same operation as on the first half, and having done this perfectly, it will be found as a result, we have a strong, even and durable piecing, which the writer can guarantee for at least eleven months, providing the rope is running under proper conditions.

Now having completed the "taking-in" of the ends of the opposite strands as shown and made a piecing, say six or eight inches long, the waste ends can be cut away, and the job is finished. In conclusion, it would perhaps be advisable to give a few rules to follow regarding rope

FIG 7

splicing as we have dealt with it in this article, and the following will be found very beneficial as a guidance for the beginner:

1. Always have the center strand under the other two on both ends of the rope.
2. Divide the strands evenly always.
3. When lapping the strands always pull each strand evenly away from the body.
4. Do not make hard piecings. The soft and pliable piecings last longer.

With these four rules and a little practice, any one can make a good piecing on any three-strand rope, and the writer hopes that at least some reader will benefit by them or pass them on to some of his grinders who still cling to the easy way, as they sometimes call it, though as we know, a rope when spliced evenly is far more durable than one which is made so that the edges of the pulleys on which it drives are cutting it and so lessen the life of it and helps to pile up the rope waste, not to mention the extra work. The writer above all strongly recommends this method of splicing for ropes used for grinding.

D. E. (R. I.)

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Why Bobbins Roll at the Battery.

EDITOR COTTON:

In reference to the rolling of bobbins in the loom battery, which has been under discussion for several months through the pages of COTTON, I will endeavor to explain the effect that a worn rocker shaft will have on making a bobbin roll. First, pull the lay forward until the protection daggers strike the frog steels, with the shuttle in the battery end. This should give a measurement of 1¾ inches from the battery head shoulder bottom to the end plate. From the lay end plate to the end of the supporter, where the barrel end of the bobbin lays, the measurement is 2 inches, and if the rocker shaft is worn half in two, can this measurement be gotten? I would say no.

The leather washer on the supporter bolt is a very important factor at this point. The washer being too thick will drop the bobbin too far down out of the battery disc slot. This will give the bobbin too much freedom on the barrel end. The lost motion in the rocker shaft will prohibit the loom fixer from getting the proper measurement required for the transferrer hammer carrying the bobbin from the disc to the shuttle. This lets the lay end down and makes the distance from the bobbin disc to the shuttle too great over the proper measurement that should be used in timing the bobbin from the disc to the shuttle, giving the transferrer hammer too much space.

I will try to explain what I mean by this space. Measuring from the end of the transferrer hammer on the inside, at the point that transfers the bobbin, it is four inches to the lay end plate. Only 2¾ inches out of the foregoing is all that is required of the transferrer hammer for its stroke. Any more than this is on the turning point of the transferrer, which pulls it too far forward in a digging position, bringing the bobbin with it, and it will turn the bobbin loose at the barrel end, before it reaches the shuttle. If the transferrer hammer were not held on the stud with a spring it would revolve around; therefore, we would have to figure its revolution instead of its stroke.

Now let's go over this worn rocker shaft thoroughly and see if we can't find most of our causes for bobbin rolling. Suppose the rocker shaft were worn half in two; this lets the lay down half an inch; that takes the swords down half an inch; that takes the bunter down half an inch too low for the latch finger, which takes the race plate down half an inch, leaving the temples too high, the yarn too high, and making the transferrer 4½ inches from the end plate where it should be only four inches, making the pitmans half an inch low on the eccentric pin end. This causes the pitman stroke to be half an inch too low, and certainly the lower they are the further forward the lay comes, and by so doing causes the bobbin to roll.

Investigating the worn rocker shaft a little further for evidence, we know it to be a fact that the lay has gone down as much as the rocker shaft is worn out. This will necessitate a considerable adjustment to be made practically on all the mechanical parts of the loom. The lay being down will cause the filling forks to be too short on the tip ends. In the filling grate oftentimes the filling will loop under the bottom of the filling fork and will cause a thin place in the cloth. Also, the draw arm, which is attached to the sword, goes down with this worn rocker shaft. This causes the controlling rod, which is connected to the let-off controller to drag on the warp controlling stud. This declines to put a binding disposition on the let-off and will cause wavy cloth, because the let-off should work absolutely free. This is getting us into the let-off discussions that are also current in COTTON.

Again, suppose we buy starch and size from every starch and size maker we hear of. Could we have uniform warps in the weave room? I should say not. We would have to simmer down to one make of starch and one make of compound to get a uniform set of warps. The same question arises as to shuttle makers and bobbin makers. To get the best results, I believe we should use one make of shuttles and one make of bobbins. The same question arises as to supplies used in replacing the worn-out parts, and these should be bought at the proper places and not made hit or miss.

I have used a part of the foregoing as an illustration. Let's see the cam shaft gear and the crown gear, we know they wear out on the pick and have to be changed for a new pick. The loom fixer should be very particular in making this change as he is likely to put the worn pick in the crown gear just in time for the transferrer to change, and if the gear were worn too badly on the pick to give satisfaction on the loom, it is too badly worn to give satisfaction for the transferrer in its quick actiton.

Straight teeth in the cam shaft gear and crown gear give more trouble than the saw-tooth gear, speaking from experience on both.

Now let's get back to the subject of the rocker shaft. The rocker shaft being worn on the shifter end of the loom and not worn on the battery end of the loom unlevels the lay and forces the shuttle, when delivered from the shifter end to the battery, to climb a hill, and after getting under the battery, and the transferrer changes bobbins. Now understand, the lay is down at one end and reared up at the other end. As the bobbin is changed, the prong on the transferrer sends the small end of the bobbin too deep in the shuttle, which causes the prong to remain too long on the small end of the bobbin before it can release itself to a clearing position, and the small end of the bobbin will have to flip upward to get in line with the barrel end of the bobbin. This will break the filling between the transferrer prong and the thread spool on the battery, and the shuttle will have to be reloaded time and again.

Now, if the rocker shaft is good on the shifter end and worn out on the battery end, this will give the shuttle a downhill travel to the battery. The transferrer changes bobbins at this point. The transferrer prong cannot put the small end of the bobbin down level with the barrel end, and the small end of the bobbin will have to flip downward to get on a level with the barrel end of the bobbin. This will cause the filling to break between the transferrer prong and the battery thread spool.

We will now examine the belts. A belt which is too slack on the loom will give trouble as the loom changes bobbins. This bobbin changing seems to be the hardest strain on the loom, therefore, power and a steady transmission are required. When the belt slips on the bobbin change it kills the power of the transferrer delivering the bobbin to the shuttle, and by thus doing either the bobbin will roll out, or hang in the shuttle, and is more than likely to cause a smash. A belt which is too tight is an enemy to a loom. They are commonly known throughout the weaving by their jerking abilities. Belts should only be tight enough to start the loom with the cranks on the

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bottom center without causing the loom to slam off.

The object of including belts in this letter is to try to show the cause of bobbin rolling, speed having a very important place along this line. The speed should be regular, the belts neither slipping nor jerking, but normal in their grip on the pulley. If a transferrer is properly set and timed for a loom making 160 revolutions per minute and the speed should go up to 170, I believe that room would have some bobbin rolling in it in places where previously there had not been any bobbin rolling.

The same question arises in reference to low speeds where the transferrer has been set for a higher speed. My opinion is, that the rocker shaft is one of the most frequent causes for bobbin rolling. A good foundation is the best thing to build on, and with a good rocker shaft and a good set of rocker shaft bearings, we can do some real building in the weave room, both in quality and quantity.

I shall appreciate a further discussion of this subject through your valuable paper. O. M. (S. C.)

Paying Card Hands by Drawing Frame Production.

EDITOR COTTON:

In connection with the matter of controlling waste on the drawing frame, I might describe the method we use at our plant by means of hank clocks. It may not be novel or different, but I will give you the details.

Our method is to have one set of cards feed one set of drawing frames, and pay the card hand by the number of hanks delivered by the finished drawing which he feeds. After doing this, we noticed an increased production, better work, and actually twenty per cent less re-worked waste. The card hand is more particular about laying in the laps, splicing and cleanliness, because he realizes the better the work he turns out, the less trouble the drawing frame will have in making production. He also makes it a point to see that his cards are running continually. Occasionally, when he has caught up with his work, he will help the drawing frame hand.

With this method, it is beneficial for the drawing frame hand to run as much sliver as possible from each can, therefore he is not apt to throw part of a can back to the cards when he is creeling his full cans.

O.S.(S.C.)

Cost of Roller Covering.

EDITOR COTTON:

In the June issue of COTTON I notice that "Contributor No. 655" gives his cost of roller covering at $40.00 per thousand, and I am just wondering if he is including the carding room rollers with this price, as most roller reports are made out so many spinning rollars covered and so many carding rollers covered and the base is figured from that. Or, they can be figured separately. However, after reading this report I looked up my own report for the month of August, just passed, and found that our shop had covered 11,085 spinning rollers and 510 carding rollers at a cost of $61.06 per thousand, and we are using a medium Winslow skin and a gray flannel. We think we are running at a very low cost on roller covering. Of course there are times, for instance when the shop force is working on the belting, binders for the looms, bumpers, etc., when the price

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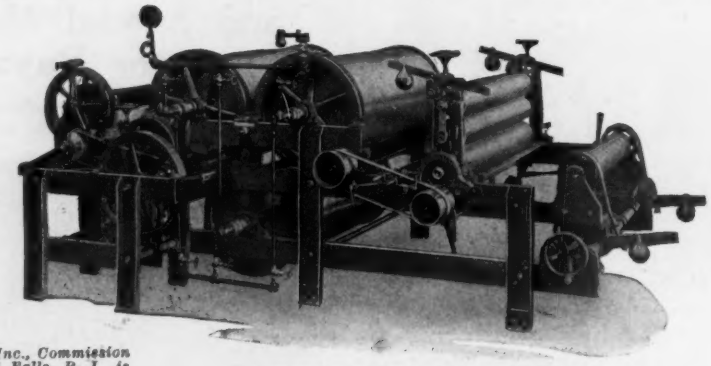

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might be pulled down some per thousand.

If this contributor is using the white cloth costing some $4.00 per yard, I hardly see how he is getting by at only $40.00 per thousand, unless he figures actual cost when making his estimates, and not including any other time which the roller shop men put in. That estimate alone is not a fair one. The time must be taken per month that the men actually put in and the rollers which they cover and figure that to get the actual cost of the shop, including the other duties which they are supposed to have. That was my estimate.

To get an estimate on a certain thing, it is not what it can be done for in connection with other duties, without separating the items and charging them separately. Then a part of the time after that they will not have this other work to keep them busy. Then this raises the price of the rollers and the results are not what they are thought to be. One of the most satisfactory methods we have ever found is for the force in the shop to be just large enough to keep the regular work out of the way—belts, binders, bumpers and other little things that naturally come up that are too numerous to mention. That is the roller shop cost and is based on the regular run of other repairs of leather.

In this connection, I just happened to notice how many cots were lost in a year's run in 1923 when we made a test. We keep all the tests. For one year we averaged 2¾ cots per skin lost in putting them on the rollers. Some years we run down as low as 1¾ cots per skin, but the 2¾ rate was the highest average. T. A. D. (GA.)

Preventing Rust On Steel Heddles.

EDITOR COTTON:

In September "How Other Men Manage", "M.E.(S.C.)" reported trouble with steel heddles developing rust on the parts not touched by the warp, about two inches down from the heddle bar. He wanted someone to give a method of cleaning the heddles.

We use a so-called rust-proof heddle, and have some that have run for years without showing any rust, but some that have been out of service and in a warehouse develop a little rust, while others that run on a very heavy sheeting under excessive humidity conditions will also show a little.

What I do is, when the wire heddles come out and after cleaning, if they show any sign of rust, I have a man go over them with a piece of slasher cloth just dampened with kerosene, and wipe them dry. I would suggest trying this a few hours before using again. In other words, care should be taken that the oil does not run to the eye of the heddle and thus make the first few yards of cloth oily.

E.T.(GA.)

EDITOR COTTON:

In regard to the cleaning of steel harness below the line where the warp rubs, the best remedy that I know is to purchase the "rust-proof" brand of heddle to start with. We have run this brand of heddle for several years and they have never shown the slightest sign of rusting.

We also brush our harness with a small hand brush about once every other day on the loom. This keeps the lint from collecting on them and also keeps them bright.

The use of a bath of caustic while hot will remove rust from ring rails, and should also remove rust from the heddles. The man who asked this question, in the September issue might try this. Taking the haddles from the frame and dipping them in a strong caustic solution while hot will remove the grease and rust.

E.F.G.(N.C.)

EDITOR COTTON:

This replies to the question of "M.E." as to how to clean that part of steel heddles that is not touched by the warp yarn.

We have never had any to rust, therefore I have never had to clean any rust from them. We use a little domestic lubricant—a very light oil—dampening a piece of waste with this oil and wiping the bars both top and bottom where they pass through the heddles. We do this in order to make them work freely. Doubtless a light film of oil coats the heddles, which prevents them from rusting.

E.S.(TEXAS)

EDITOR COTTON:

Answering "M.E.", there is nothing on the market that I know of that will clean steel heddles satisfactorily. In fact, I do not know of anything at all that could be done reasonably to help the cause, as all steel is subject to rust when exposed to humidity, and you know a certain portion of all harness does not come in contact with the yarn; therefore rust sets up.

There are several polishes on the market that will clean steel heddles, even Bon Ami will take the rust off, but they will be rusty again when they get back from the weave room. The only safe remedy I know is to exchange the old heddles for rust-proof heddles; then the problem will be solved.

P.L.(GA.)

Lumpy Sliver Caused by Bad Licker-in.

EDITOR COTTON:

Judging from the contents of the letter from our friend, "Contributor No. 1019," appearing in the "How Other Men Manage" section of the September number of COTTON concerning making cleaner yarn, I feel that my few remarks in a recent number regarding this have not helped him very much, though he tenders his thanks for what little help they may have afforded him.

However, it is evident that he is up against it, and it is my intention to offer a few other suggestions that may lead to a solution of the trouble. Of course, in my last letter I offered a good many suggestions regarding attention to the carding. I have one more to make, namely, attention to lickers-in.

I had a little trouble a few days ago through one bad licker. A drawing tender reported that one of the ends was breaking often at the front, and when she took hold of the end to make the piecing, most of the time she would find a small lump.

On investigation, extending over quite a long time, we located the bad licker which I previously mentioned and found that some teeth were missing all the way around for the space of about half an inch.

Of course such a condition resulted in allowing the stock to collect in a lump on the mote knives until large enough to be forced forward by the licker.

Since finding this I was put to thinking that perhaps

"Contributor No. 1019" might have one or a few lickers similar, if not as bad as the one I mentioned, and it is possible that these small lumps will pass through other processes with perhaps unnoticeable breakages until the yarn is to be wound.

Our friend says the owners of the mill have decided that too big a draft is the result of using four 18-ounce breaker laps to produce a 12¼-ounce finisher lap. Sure. Such a draft exceeds the limit of five usually allowed.

However, let's think this over a little. At present, our friend, by doubling three 18-ounce laps to make a finished lap of 12¼ ounces per yard, needs a draft of 4.4.

Now, I think that by making the 16-ounce laps at the breaker, thus assuring a better cleaning and removal of the heavier impurities, and also by doubling the four 16-ounce laps, to make a 13-ounce finished lap, which will be a better lap than the one made by three 18-ounce laps, he will have better carding results. Of course he will have to increase his card drafts a little.

Going back again to the draft at the finisher, our friend will see that by doubling four 16-ounce laps, as I have stated, we increase the draft only a little, but we should have cleaner laps in addition to a better doubling, and, regardless of what his employers say, a better lap for the cards.

By the way, I would also advise this contributor not to reduce his present flat speed. His card drafts would be increased from 107 to 116 and the latter draft or thereabouts is what is required in this case, and this will undoubtedly give the lickers-in a better chance to do their work if they are good enough, and I mean every one, as sometimes it is likely that there may be one or two which are not performing the duties to the fullest extent and careless grinders and card tenders do not always trouble even if they understand the damage is caused by faulty lickers-in. Of course, as I stated before, these lumps I mentioned are perhaps only passing through occasionally and therefore never get noticed only by chance, and if such lumps get by at intervals, surely impurities are getting by continually.

D. E. (R. I.)

Cleaning Low Grade Cotton.

(*Continued from page* 128.)

ing looms and 31 Draper looms, using the bunch builder.

Mr. Clarke's figure was .54 per cent. "We had a lot of waste," he added, "until we begin using a quill with a brass bushing. That's a mighty good thing, every bobbin goes down on the spindle and gives every bobbin the same height on the frame."

Mr. Burow said his waste formerly was higher, because after building the bunch the yarn would drop back down below the bunch for two or three strokes, and that when he corrected this, it reduced his waste materially.

Ingram Lee said that their overseer of spinning, Mr. Bolton, had devised a little arrangement consisting of a block fastened to the rod, which prevents the rack from going down below the rings on the bobbin, so that the doffers cannot pull the rack down for several revolutions, causing the yarn to wrap around the spindle several times.

"It seems that we are certainly doing something and getting somewhere with tests of this kind," declared Mr. Poole, and the chairman agreed, pointing out that even in the matter of quill waste, how much actual money can be saved the mill each year, and citing the fact that in most of the reports the quill waste has been reduced as a result of the experiments conducted.

The final question discussed was, "What difference, figured in percentage, should there be in the average weaving mill between total yards woven, by the weave room records, and the total yards of first quality, full-length cuts, put up for shipment, passing this percentage on the total weave room production."

Mr. Poole reported a figure of 10.7 per cent, and Mr. Clarke showed 9 to 9½ per cent for the past two years. This question, however, did not admit of much discussion, and the figures would not be comparable, since, as it was explained, the percentage of seconds depends so largely upon the class of product.

The Luncheon.

This concluded the discussion, and the luncheon, held at 12:30 o'clock was the closing feature of the meeting. President Towers was toastmaster, and introduced two of the charter members of the organization—Dan H. Poole, and George C. May. The band from the Miller Cotton Mills furnished the music for the occasion. J. M. Gregg, secretary of the Southern Textile Association, in a short talk brought the greetings of that body to the Texas organization, which is affiliated with it.

The speaker of the luncheon was Thomas F. Bush, of Bush-Witherspoon Company, Waco, cotton merchants, who discussed the matter of cotton staple. Mr. Bush declared that within recent years there has developed a tendency among the mills to use lower grades of cotton. Mills which twenty years ago brought Strict Middling and Strict Good Middling, now he said are using Strict Low and Middling in identical fabrics, without, however, decreasing the quality of the goods. This change, according to Mr. Bush, has been brought about by the improvement of cleaning machinery on the part of the manufacturers of cotton mill machinery and gin equipment.

Hugh S. Clarke and Dan Poole were appointed delegates to the Southern Textile Association convention at Birmingham. The place and date of the next meeting of the Texas association was left to the decision of the officers. Then the meeting adjourned, everyone present having had an enjoyable and profitable time.

Bakelite for Cones.

It is interesting to note the utilization of various materials created by chemical synthesis in different places in the textile industry. One of which has been recently emphasized is the use of Bakelite in the spinning of silk and rayon, because of the resinoid materials of which the Bakelite is made. An example of this is the use of a Bakelite cone, to which the mechanical strength of the resinoid gives a prolonged life. Also, the nature of the material tends to eliminate splitting, warping and cracking, and the cones, it is stated, will release all of the silk freely, reducing waste. This material is produced by the Bakelite Corp., 247 Park Avenue, New York City.

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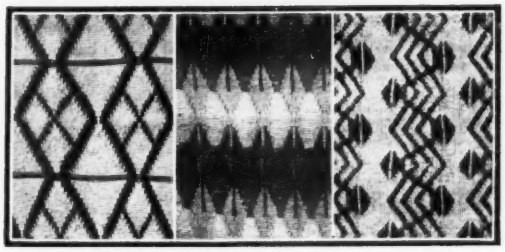

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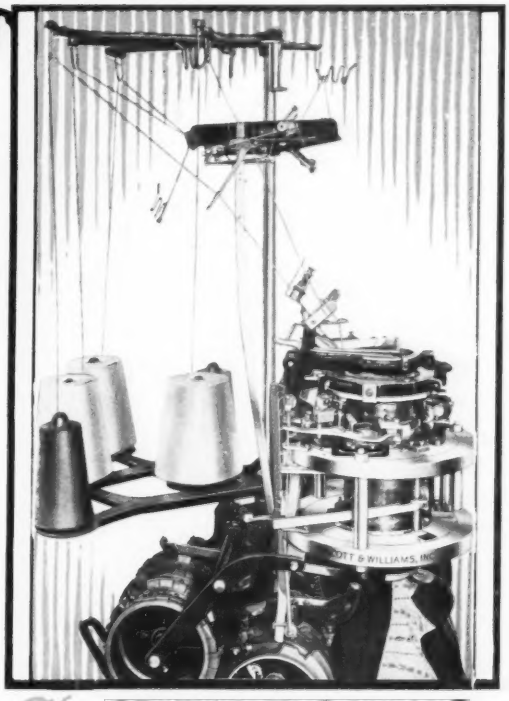

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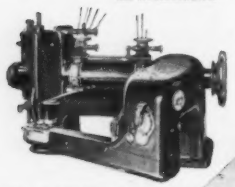

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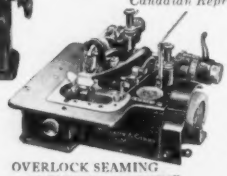

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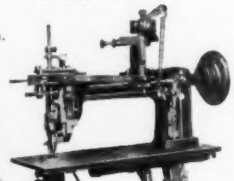

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Accurate Costing On Full-Fashioned Hosiery

Knowing Cost Figures are Accurate, and Basing Selling Price on Exact Cost Instead of on Guesswork, Defines the Working Formula of the Successful Mill

BY C. H. BAXTER.

Are your costs accurate and correct? How often this question arises in a full-fashioned hosiery plant. And how often when an investigation is made, it is found that many small items were overlooked that should have been added to the cost sheet.

Recently I had the head of a small full-fashioned hosiery concern come to me with the story that although his plant had been running continually on a full time basis, and at times overtime, he was losing money. He asked if I would help him find where his losses occurred. Upon investigating his costs I found several items, such as the amount of material used in the stocking, the amount of waste made, and some labor items that were incorrect and he was actually selling his hosiery at just about cost. I have known several cases of this kind and the purpose of this article is to give the readers my experience in connection with making up costs in a full-fashioned hosiery plant, so that one is absolutely sure that the costs are correct when the cost sheets are finished.

Costing of hosiery is one thing upon which considerable time and thought must be given and a thorough check should be made after the cost is determined to see if something has not been left out.

When making up the cost of a certain style number, the first thing that should be done is to get the cost of material used. As an illustration, let us say that the manufacturer will make an 8 strand, cotton welt, cotton heel, sole and toe style number. In the welt of this number, he decides to use 60s 2-ply yarn. The leg and foot, of course, will be 8 strand silk. For splicing he will use 90s 2-ply yarn, and in the heel two ends of 80s 2-ply yarn will be used. The sole of the foot will be made with 50s 2-ply yarn, and in the toe, two ends of 70s 2-ply yarn will be used. As the reader will note the construction of such a hose contains various sizes of cotton yarns and this is done with the purpose of explaining very thoroughly how to arrive at accurate costs.

Samples must first be made to determine the exact length, and number of courses, or in other words, costing should not be done until the particular style number has been established as being standard in every way.

After the style number is considered as standard, secure eight stockings, using size 9½, and be positive that each of the eight stockings are exactly the same length and contain the same number of courses per inch. Also secure five dozen stockings, but it is not necessary to have these exact in length and courses. It is better to take five dozen as they come from the machines during the course of any working day.

Before proceeding any further a cost sheet should be prepared and the heading should tell the style number and date when the cost was taken. The accompanying cost sheet sketch will show how to list the various material items before putting down the weights and costs of materials as per weights.

HOSIERY COST SHEET.

Style 100 Aug. 15, 1927.

Where Material Is Used	Kind of Material Used	Weight	Cost of Material Used
Cotton in welt	60s/2		
Silk in leg	8 thd.		
Splicing in heel.....	90s/2		
Cotton in heel	2 ends 80s/2		
Silk in foot	8 thd.		
Cotton in sole	50s/2		
Cotton in toe	2 ends 70s/2		
Seaming thread	.....		
Topping waste	80s/2		
Looping waste	80s/2		
General waste	Silk		
General waste	Cotton		

Before dissecting and weighing the material, be sure that not only the eight stockings, but also the five dozen are thoroughly dried out, because if the stockings contain moisture this will increase the weight and therefore the weights would be neither accurate nor correct. Try to have the stockings in the same condition as the material was in when it was first purchased.

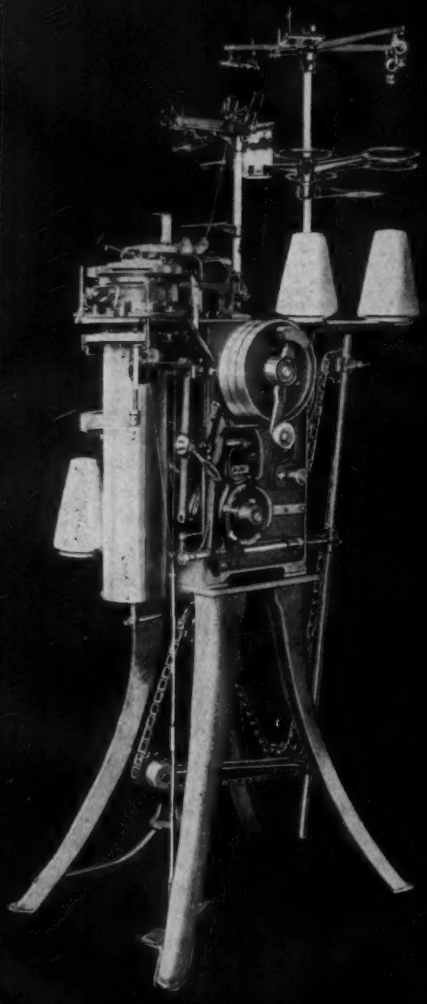
In weighing the various materials used, use a scale that will weigh in grains and this is as fine a scale as is necessary.

The purpose of using eight stockings is to dissect four stockings and leave the other four stockings for the purpose of checking the total weight.

In dissecting, start the dissection at the loose course in the toe. Dissect one stocking at a time. As each part is dissected, weigh on scales and multiply the weight of each part by twenty-four and this will give the weight per dozen of each part. For instance, if the weight of the 70s 2-ply yarn in the toe of one stocking would weigh 36½ grains, multiply 36½ by 24, which would amount to 876 grains. As there are 437½ grains to an ounce, the weight of the 70s 2-ply would be two ounces. This method should be followed through the whole stocking, dissecting the toe, the cotton in the sole, the silk in the foot, the cotton in the heel, the splicing, the silk in the leg and the cotton in the welt. To be accurate, it is best to unravel rather than cut out each part, as then you are positive that you get all the material from each part. After getting the weight of one stocking, repeat the same process with three more stockings. Keep a record of the weight of each stocking to see if there is any variation or difference in the various weights.

After securing the weights of the dissected stockings, take the four stockings not dissected and weigh each one separately, keeping a record of the total weight of each stocking. Then weigh all four stockings not dissected and compare the weight of these four with all the material weighed from the dissected stockings. I might add that it is a good idea to weigh all materials from each dissected stocking for comparison with total weight of each dissected part of the stocking.

There will always be a slight difference in weights of each stocking weighed and for this reason four stockings are used, instead of relying upon the accuracy of the weight of one stocking as being correct at all times. By



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taking the average weight of the four stockings as a cost weight, this should give the correct cost as far as material is concerned.

After the cost weights have been determined as being accurate, take the five dozen of hose and weigh each dozen and compare the weight of each with the weight of the dissected stockings. The total weight of each of the five dozen should average the same as the dissected weight and if this does not compare, an investigation should be made to find out where the loss or gain of weight lies. That is the reson why it is best to take five dozen from the general run of stockings, rather than to select five dozen purposely for this work, because sometimes it occurs that the knitter is making the stocking different from the standard required by either making them too long or too short or too tight or too loose in courses per inch.

The problem that presents itself, and really is a problem as far as trying to get accuracy is concerned, is the weight of the waste made per dozen. The waste made by the toppers and loopers can be obtained easily by simply securing the waste from one dozen made by a topper and do likewise with the looping waste. The thread or yarn used by the seamers should also be weighed by taking out the seam of one dozen pairs of stockings and weighing the entire amount. This is one item sometimes forgotten and it is surprising how much seaming material is used over a period of time.

When weighing the looping waste, include the amount of thread used for looping, as this is too small to be listed separately, still it is another item of material used and should be included in the cost.

It is almost impossible to secure an accurate cost per dozen on the amount of general waste that is made in connection with manufacturing full-fashioned hosiery. The nearest possible figures I have been able to obtain is by the two following methods:

First install a system of securing the amount of waste made each week by each employee, whose operation is one on which some waste must be made. The way to obtain this, is by having two waste bags for each operator; one for silk and one for cotton. These bags should be numbered to correspond with the machine number. Each week these bags are collected and each bag weighed and recorded against the individual from whom the bag was taken. Take the total waste made over a period of three months and divide this total by the total dozens made over the same period and this will give the average waste made per dozen.

There should be added to this 15 per cent additional to take care of unseen losses in waste, which was not recorded. There is always unseen waste, including what is found in the sweepings, that is not recorded. By adding 15 per cent, the costs are fully covered in this item.

The other method is one which should be used as a check on the cost weights. Figure out from your cost weights secured through dissecting, how much material of each kind and count it would require to make one hundred dozen pair of hose. Weigh up the exact amount of material needed and have two knitters use this up to see how many dozen they can secure from the amount of material allotted. The reason two knitters should be used is because one may be more wasteful than the other and by using two knitters, a better check is secured. When all the material is used up, this should make one hundred dozen and if it did not make that amount, usually it has been wasted. If more is made, then one knows that the waste figures are too high.

Now comes the matter of securing the labor costs, overhead cost of irregulars, damaged hosiery, and selling expense. Let us take our 8 strand hose as an example.

First the various operations should be listed on the cost sheet as follows:

LABOR COST.

Skein Winding
Cone Winding
Legging
Legger Helper
Leg Examining
Topping
Footing
Footer Helper
Foot Examining
Looping
Seaming
Grey Goods Examining and Turning
Dyeing
Boarding
Finished Goods Examining
Mending Gray and Finished Goods
Boxing
Boxes, Bands, Labels, Etc.
Overhead
Loss from Irregulars, Etc.
Selling Expense
Discounts and Advertising

As shown by the labor cost list, practically every operation known to manufacturing of full-fashioned hosiery is listed. This, however, does not mean that every plant has all these operations, so one must list such operations as are in use at the particular plant in question.

Practically all the direct manufacturing operations in the making of full-fashioned hosiery are based on piece rates, or in other words for each operation a price per dozen is paid to the operator. So it would appear as if all that is necessary is to list the price paid for each operation opposite such operation as listed on the cost sheet.

But in manufacturing, there are additional expenses connected with each and every operation. New operators must continually be taught or trained and wages are paid while learning. Very little production is secured for some time and therefore this increases the price per dozen for any one operation. There are also times when day work is paid to an operator for various reasons. This will increase the cost of any one operation. Labor turn-over is an item in itself and must be taken into consideration.

In some places, cone winding is paid day work instead of piece work and where such is the case, it is necessary to find out what it cost per pound to wind the material.

In the dyeing, boarding, and finished examining, the cost must be figured to include re-dyes, as this is a double cost, because there is an additional cost for the second dyeing. These goods, therefore, must be boarded and examined again, so this is another additional cost.

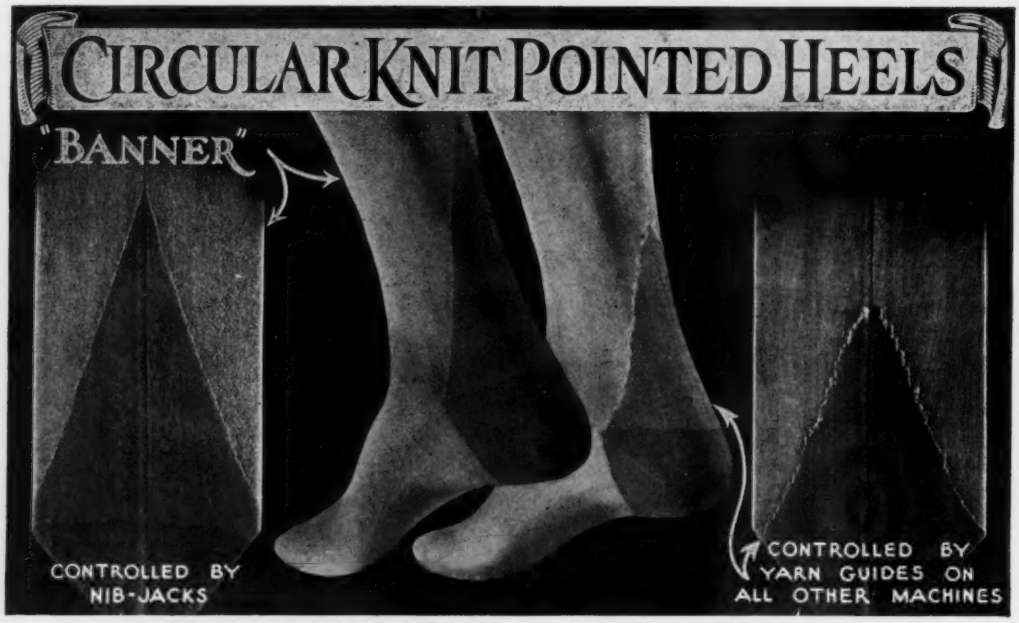
Overhead should be figured on what it has cost in overhead over a period of three months and sometimes it is well to extend this to a six months' period. Overhead items should be carefully checked and listed as this is also one place in making up costs that many small items are overlooked.

When all items and operations have been determined, listed, and checked thoroughly, the cost is finally made up and the final cost sheet should appear complete, as per the accompanying outline.

For illustration purpose I will use the following purchasing prices of materials used:

60s/2 yarn	$ .80 per pound
8 thread thrown silk	$6.40 per pound
90s/2 yarn	$1.60 per pound
80s/2 yarn	1.28 per pound

CIRCULAR KNIT POINTED HEELS



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70s/2 yarn ..... .72 per pound
Looping and seaming thread .... $2.40 per pound

HOSIERY COST SHEET.

Style 100 Date, Aug. 15, 1927.

MATERIAL COST.

Where Material Is Used	Kind of Material Used	Weight	Cost of Material Used
Cotton in welt	60s/2	4 Oz.	$ .20
Silk in leg	8 thd.	10 Oz.	4.00
Splicing in heel ...	90s/2	1 Oz.	.10
Cotton in heel	80s/2—2 ends	2 Oz.	.16
Silk in leg	8 thd.	2 Oz.	.80
Cotton in sole	50s/2	2½ Oz.	.10
Cotton in toe ...	70s/2, 2 ends	3¼ Oz.	.15
Seaming thread ...		¼ Oz.	.04
Topping Waste ...	80s/2	⅛ Oz.	.01
Looping Waste	80s/2	⅛ Oz.	.01
General Waste	Silk	½ Oz.	.20
General Waste	Cotton	¾ Oz.	.07
Total Material Cost			$5.84

LABOR COST.

Operation	Price per Dozen or Pound	Extras
Skein winding	$ .10	$ .01
Cone winding	.05	
Legging	1.00	.05
Legger helper	.10	
Leg examining	.05	
Topping	.25	.01
Footing	.40	.02
Footer helper	.05	
Looping	.20	.01
Seaming	.20	.01
Grey goods examining and turning	.10	
Dyeing	.30	.02
Boarding	.15	.01
Finished goods examined	.05	.01
Mending gray and finished goods..	.05	.01
Boxing	.02	
Total labor cost, including extras, ...		$3.23

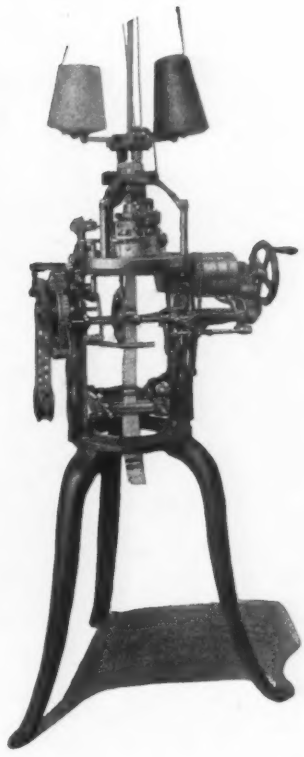
Boxes, bands, labels, etc	.10
Overhead	1.50
Loss from irregulars, etc., 10%..	.40
Selling expense, 5%.....	.70
Discounts and advertising, 5%...	.70
Total miscellaneous cost	$3.40

Material .....$	5.84
Labor	3.23
Miscellaenous	3.40
Total cost .....$	12.47

Selling price, $14.00 per dozen.

Some may wonder why it is necessary to place the date on the cost sheet, showing the day, month and year the cost was taken on a particular style. But one must bear in mind that the purchasing cost of materials fluctuate in prices, especially silk, and because of this, it is well to check over the cost sheet against any new prices of material every so often and make necessary changes in the figures to conform with the new prices paid for the materials. If one has the date on the cost sheet, it is an easy matter to find out at what price materials were purchased at the time the cost sheet was made up. Personally I have always pinned a slip to the cost sheet at the time it was made up, showing the purchase price of all materials used in connection with the particular style shown on the cost sheet.

Anyone using this system of costing will find that it is an accurate way of finding out what it costs to make a certain style number in full-fashioned silk hosiery and, as knowing costs are important in successfully operating a mill, the adoption of a tried and proven system or method is one thing that eliminates the danger of operating at a loss. When one knows the costs, and knows them to be accurate, one can easily establish a selling price and by operating the plant so that the material, labor and overhead cost do not at any time exceed the figures that are listed on the cost sheet, one should at all times know what profit is being made on every dozen of silk hosiery produced.



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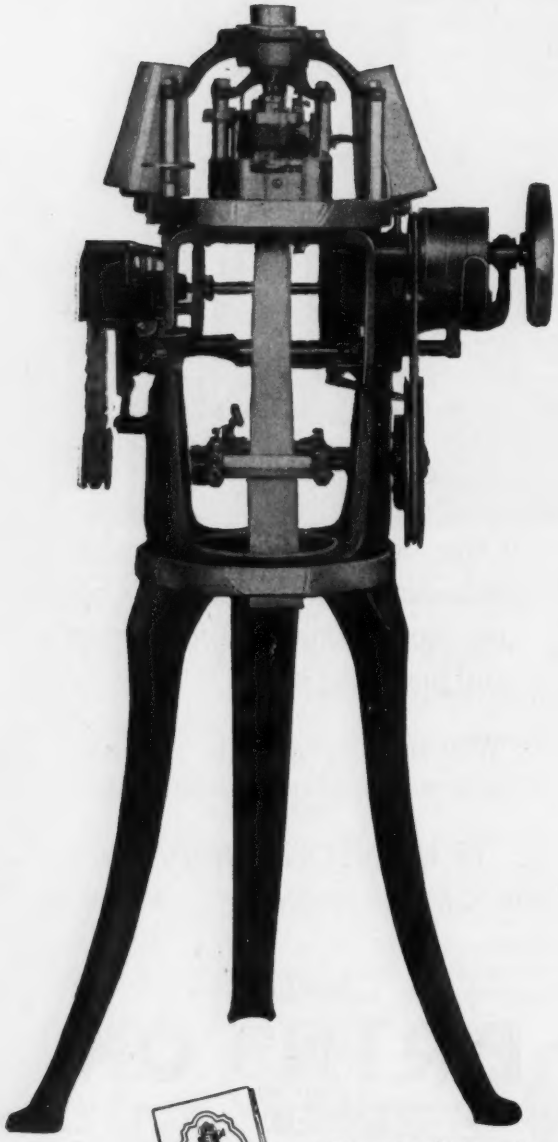

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The A B C of Dyeing

Oil Spots, Mildew Spots and Just Spots—Bad Water from a Neglected Filter Not Only Makes Spots, but Uneven Work —Remedies and Preventives

BY NOEL D. WHITE

PART SEVEN.

In the November installment I tried to emphasize the necessity of clear, soft and plenty of water in order to obtain the best results in the dyehouse. Whether the water is obtained from a stream, a lake, or a spring, it is not to be relied upon unless it is filtered. It may be as clear as crystal and too hard for dyeing, or it may be soft and muddy, or yellow from decaying vegetation, also variable in composition and differing in pollution from time to time. Water supply from city and town reservoirs even though filtered and made potable is not soft, nor clear enough in most cases for use in the dyehouse, and must be corrected. So it is plain that a good filter is needed for successful work.

But even though a filter is installed, it cannot be relied upon to furnish good water continuously unless it is properly taken care of. The first outlay of money to install a filter is the biggest expense incurred, the cost of maintenance is negligible considering the results obtained, but if it is neglected, trouble will surely result from it.

Maybe, some day, someone will perfect a filter for water which will take care of itself. That is, it will wash itself automatically after it has filtered the full amount of water it is designed for, or it will regenerate itself when it needs it; but, until then we must be sure and do it. Someone appointed for that job must not neglect it.

In a dyehouse in a city in the state of New York I found a small filter that was to be used to clarify the water for dyeing light colors and white. They were using city water, but this water was still slightly colored and could only be used for black and dark shades. When I investigated this filter to learn the manipulation of it, I found that it did not work. The dyer who had the job before me thought he did not need that filter and never used it. His work was so bad that he had to be dismissed and it is a sure bet he never knew the cause of his failure was his neglect to operate that filter, and keep it in condition for proper work. My first job there was to overhaul that filter and put it in working condition. That was a good many years ago and filtering had not attained the perfection of today, where there are filters manufactured in any dimension and for every conceivable purpose. What happens if the water filter is neglected will be illustrated here in a case that came under my observation.

In a hosiery mill a zeolite filter was installed to correct the city water supply which proved to be too hard and containing a large quantity of alum. The dyer took care of it, and everything proceeded satisfactorily with the work for a time. The mill prospered to such an extent that the dyer found his duties so pressing it was decided to teach someone how to take care of the filter, and take it off his mind.

Now the work of taking care of a filter of this type is such that a child can do it. The only thing to do is to watch the meter and test the water, after so much has passed through, and see that the water is still soft. In a bottle 40 c. c. of water is drawn, and if from one to three drops of a standard solution of soap, after being shaken vigorously in it, fails to raise a strong lather, it is time to regenerate the zeolite. Failing to do this the water begins to pass through harder and harder until it is as bad as before entering the filter.

The man who was put in charge of that filter learned to take care of it quite readily, and no trouble was encountered at first. Then one day the dyer was called into the inspecting room to be shown a lot that was full of grease spots throughout; not a stocking was free from spots. He could not account for it. Of course, in such a case the first thing to do is to find a way to remove the spots. They were the size of a pin head; some single, others three or four in a bunch. That it was grease there was no doubt.

The dyer took the lot, bagged it again and put it back in a machine. With 2 per cent of soap and a handful of soda ash in water at 100 degrees F., running in the machine for 20 minutes, all spots were nicely removed, and the lot was finished in the usual way. That day they had several lots spotted the same way, and nothing to indicate where they came from. That dyer got greyhaired over it, but could not find the source of the trouble. Then, as if by magic, no more spots appeared for some time and everything seemed pretty again, and the incident was forgotten. Sometime later a few more lots happened to be spotted in the same way, and a few more grey hairs grew on that dyer's head, but no solution of the mystery.

The spots kept coming now and then for a time, and then one day the dyer thought he would watch how the filter was taken care of. He procured a dropper and a bottle of soap of a standard solution, and with a testing bottle he decided to test the water three times a day.

As I have said, from one to three drops of soap should raise a lather in 40 c.c. of filtered water. For a time nothing to show carelessness or neglect occurred, but one day at closing time the dyer found that the water he was testing would not lather with less than 8 drops of soap, and a weak lather at that. He promptly went to investigate and found that the man in charge of the filter had forgotten to look after it all day, having been kept busy elsewhere. If he had forgotten this time, it is more than likely he forgot at other times as well, thought the dyer. Now he would watch and see what would happen.

He marked on the back all the tickets of lots dyed and to be dyed with the water at that degree of softness. The filter was regenerated at once, but the work had proceeded with the hard water, the reservoir was full of it and the work was started the next morning with that water.

That watching produced results. Half of the work the following day was reported full of grease spots with the same earmarks that had characterized the spotted lots on previous occasions, and that dyer heaved a sigh of relief. He had found the source of that trouble.

However, that is not the only trouble resulting from bad water through neglecting a water filter. Uneven work

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is likely to be the consequence, also. With a formula arrived at with soft water, if the water is changed the color also changes. The cotton may take a different shade than the silk, the softness is impaired, the dyestuff is harder to dissolve and may go in the bath with particles still undissolved, and these attach themselves to the goods, producing spots extremely difficult to remove. The dyestuffs should always be strained when going in the dye bath, but this is sometimes neglected.

One very common source of spots is that caused by mildew. Of course in this case the dyer has no control over it except perhaps he can finish his goods with a preventive.

Mildew spots come in every color of the rainbow and are caused by the goods being kept too long in a damp condition before boarding. The boarders must have the goods with a certain amount of moisture in them to be finished properly. For that reason goods are kept in bins that have no ventilation, and sometimes are kept too long in an ideal condition for mold and mildew spots to develop.

The obvious remedy for that should be to board the goods as soon as possible after being delivered from the dyehouse. They should not be kept in a moist condition any longer than a day or two. We have found that by using one per cent of Isomerpine in the finishing bath, we can keep goods for quite a long time without a trace of mold appearing. How long they can be kept without molding, however, I am not prepared to say. Goods spotted from mildew and mold are easily detected by their peculiar odor.

A thorough washing and drying of bins and sacks where the goods are kept for the boarders, now and then, is also a good preventive. Goods spotted with mold and mildew are very hard to correct, and even stripping will leave a trace of them.

Another source of worry and trouble for the dyer is goods coming in the dyehouse spotted with oil in rings up and down the leg, in the gores, and from oil drippings. Goods that are spotted in this way should be removed from the stock and sent to the dyehouse separately for a special cleaning which can be easily done by soaking for a few hours in a soap solution made up with about 20 per cent soap and 2 per cent soda ash at 120 degrees to 140 degrees F., but no higher, then tumbled for about 30 minutes to remove the saponified oil spots. I am aware, however, that it is extremely difficult to make the superintendent, or whoever is in charge of that particular department, see the advisability of doing so. They seem to think that the dyer should remove all spots of whatever nature they may be. They do not want to believe that boiling that oil in the goods only makes it faster and harder to remove afterwards. While it would have been easier to remove the spots by tumbling after soaking in the warm soap; after boiling them in the only way to get rid of them is by long and hard rubbing if they can be removed at all.

Of course, re-dyeing into black is the only solution. All lots could be given the soaking treatment I have mentioned, but that would entail a large and needless expense to say nothing of the time lost, while by removing the spotted hosiery from the stock, one or at most two lots in a week would be all that is necessary to clean.

Another source of spotted work which can be avoided or at least reduced to a minimum is in the boarding room. I have seen as many as three dozen pairs of hosiery soiled by the hands of a boarder who had neglected to clean his hands properly before starting his work of boarding a new lot. Some colors, which in the mind of such operators appeared dark when moist, showed very plainly the streaks produced by his dirty hands rubbing down the hose on the boards, when those hose reached the finished product. A watchful eye on the part of the boss here would pay handsomely.

From the foregoing it is easily seen that most of the bad work for which the dyer is held responsible is avoidable by using proper care and common sense. In some cases the dyer has absolutely no control over the situation, but he is blamed if the work goes out from the dyehouse in bad condition, so it is up to him to do the best he can.

As in the case of streaky gores, he is told that it is an unavoidable evil, and I believed it until the month of September when I read in that month's edition of COTTON a contribution from a reader which throws a different light upon the situation. He claims that by a proper cleaning of the new needles in the knitting machine, heels and toes can be kept clean. If any of my readers have not read that contribution, I urge them to do so. They will find it interesting as I did, and maybe derive some good from it. It is on page 1169.

Sometimes small lumps of grease of different size and shape appear floating on top of the dyeing bath. One of these lumps caught and squeezed through the fingers will show an oily green or brown color. A look on the inside of the vat will show, starting just above the level of the bath and up a few inches, that both sides of the vat are covered with a film of grease that has accumulated there and is being released in small particles by the agitation of the rotating drums. These work their way in front and back and into the drum to be taken up by the goods. If left undisturbed that lot will be found to be full of spots.

Hard water may be the cause sometimes, but imperfect washing is sure to be the reason for that. In washing a boiled-off lot two waters at 120 degrees F., should be sufficient; each washing should be of a duration of not less than fifteen minutes in the rotating machine. Cold water will not wash out a boil-off bath, and should be warmed; but too hot a washing is also injurious as it breaks up the soap on the goods instead of washing it out gradually without breaking up. Then a good whizzing in the extractor will leave the goods in an ideal condition to be dyed without trouble.

When the bath is found in the condition just described, which is generally towards the end of the dyeing operation, having taken about that much time for the grease to accumulate to the sides of the vat in enough quantity to start getting loose, the best way we have found to get rid of it with a minimum amount of damaged goods is to flood the bath with water. Let the water run in one end of the machine, the end that happens to be the highest from the floor, and out the other end, for a few minutes before emptying the vat and it will be found that most of that grease will have floated out. When the lot is finished and taken out, naturally a thorough cleaning of the machine is necessary.

For the next installment I will write about matching colors in and out of the dyehouse. I will give in it my way of doing it and my experiences, with the expectation that some of the readers will give their opinion in the matter, to be discussed for the benefit of all interested in the "Knitting Kinks" department.

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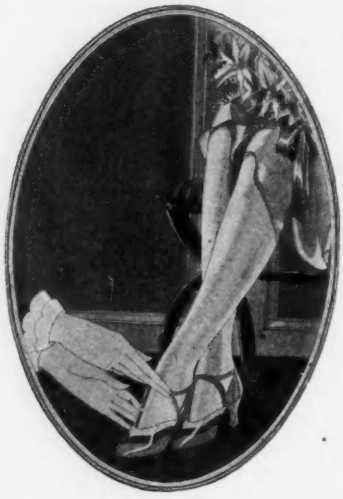

Concerning Profits

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Cost Accounting In Knit Goods Finishing

Checking Up on Comparative Costs on Clocking, Welting and Other Seams Utilized in the Manufacture of Knitted Garments

BY WILLIAM DAVIS, M. A.

The maker of knit goods cannot get very far to-day without having to encounter one or another of the more fancy types of hosiery seaming and stitching. In footwear, the system of clocking is an old favorite and is still largely adopted for ornamentation. The flatlock seam is also similarly adopted for this purpose and there are several other variations such as the zig-zag or the herringbone stitch for necking garments, and the double-lock chain stitch with its so-called interlock varieties which are also employed for the severely utilitarian purposes of fabric joining, but also for operations such as lace attaching where the fancy features of such stitches are featured.

This latter variety is found in five threads, four threads down to two threads, in all of which styles only one looper operates under the fabric in the machine, the other elements are introduced from above and intersect with the thread from the looper. There is further the covering thread which, as in the flatlock seam, moves backwards and forwards over the join and has the function of obscuring the raw edges of the join.

When the cost per 1000 yards is at hand for all such operations, it is a simple matter to measure the length of ornamentation which occurs in one dozen garments or one dozen pairs of hose and making a satisfactory allowance for waste material, to derive the cost of the operation. But by working out the operations accurately with the minimum take-up it becomes possible also to arrive at an accurate idea of the relative efficiency of various machines or their operators. It is possible to compare the results from individual machines in this respect, as it has been too often proven that in a plant some machines run persistently under normal efficiency and it becomes possible in this way to single out machines which may have done their day of service and require substituting by newer models.

Clocking.

Clocking is done very largely up the sides of hose where a plain line is attached, surmounted by a simple floral arrow device which gives it a more finished appearance. The two-thread overlock seam method is employed where a needle is fitted with ordinary cotton such as 60/3 counts and the looper is given the thread in which the device has to be worked. Mercerized cotton is largely used and latterly artificial silk has come to the front. Herewith are given the results of two factory tests in connection with this operation where the amount of the fancy yarn is varied in length and the resulting figures show the difference in cost which this alteration envolves.

Example 1. In a clocking system where 60/3 yarn at $1.60 per pound is used for the needle, and 150 denier rayon at $1.80 for the looper, show the difference in cost per 1000 yards of clocking between tests *A* and *B*: Converting the rayon we have $5282.5 \div 150 = 35.2$ cotton counts equivalent. 5282.5 is the cotton conversion constant.

Test A: Needle = 4.6 take-up
Looper = 4.9
Total = 9.5 take-up

Test B: Needle = 5.2
Looper = 7.5
Total = 12.7

$$\textit{Test A}: \text{Needle } \frac{4600 \times 160}{20 \times 840} = 43.8 \text{ cents.}$$

$$\text{Looper } \frac{4900 \times 180}{35.2 \times 840} = 29.6 \text{ cents.}$$

$$\textit{Test B}: \text{Needle } \frac{5200 \times 160}{20 \times 840} = 49.5 \text{ cents.}$$

$$\text{Looper } \frac{7500 \times 180}{35.2 \times 840} = 45.7 \text{ cents.}$$

The totals of *Test A* for the entire seaming or clocking operation amount to $43.8 + 29.6 = 73.4$ cents per 1000 yards of clocking, and in *Test B* $49.5 + 45.7 = 95.2$ cents, which shows that *Test B* is $95.2 - 73.4 = 21.8$ cents per 1000 yards more costly than *Test A*.

Welting.

In hosiery taken from the automatic hose machines, where no provision is afforded for turning the welt automatically, this turning in of the top requires to be performed at a second operation. It is a variation on the overlock seam with the two threads but a special precaution avoids showing the stitching on the face of the article. Two tests are herewith given of practical instances of the amount of material absorbed in this process.

Example 2. Find the cost per 1000 yards of welting performed in the two tests *A* and *B* where the needle thread is composed of 80/3 sewing cotton at $1.80 and the looper has 60/2 worsted yarn at $1.75 per pound.

Test A: Needle = 7.5 take-up
Looper = 6.3 take-up
Total = 13.8

Test B: Needle = 8.2 take-up
Looper = 4.25 take-up
Total = 12.45

$$\textit{Test A}: \text{Needle } \frac{7500 \times 180 \times 3}{840 \times 80} = 60.2 \text{ cents.}$$

$$\text{Looper } \frac{6300 \times 175}{30 \times 560} = 65.9 \text{ cents.}$$

$60.2 + 65.9 =$ Total $= 126.1$ cents per 1000 yards of welting.

$$\textit{Test B}: \text{Needle } \frac{8200 \times 180 \times 3}{840 \times 80} = 66 \text{ cents.}$$

$$\text{Looper } \frac{4250 \times 175}{30 \times 560} = 44.2 \text{ cents.}$$

Total for *Test B* = 110.2 which is 15.9 cents per 1000 yards less than *Test A*.

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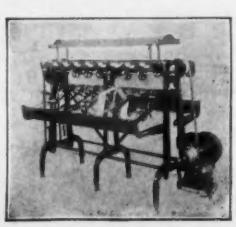


Find the difference in price per 1000 yards of welting if the operation is performed on real silk hose and 90/2 spun silk thread = 45s cotton counts at $2.50 is employed. The take-up of the needle is 6.4 and that of the looper is 7.2

Needle $\frac{6400 \times 180 \times 3}{840 \times 80} = 51.4$ cents.

Looper $\frac{7200 \times 250}{45 \times 840} = 47.6$ cents.

The total of the two elements is $47.6 + 51.4 = 99$ cents per 1000 yards of welting. This result is rather surprising for it shows that in some cases an apparently higher priced yarn can be employed at a less cost than a lower priced one. In this case the welt is in silk to correspond with the articles in this material and the cost is actually less than a corresponding welt in woolen material. This comes about chiefly from the take-up, of course, but also from the fact that the silk yarn is in finer counts and thus seams a larger number of hose.

Example 3. If it requires 20 yards of seam per dozen hose in 60/3 needle and 40/2 looper, find the increased number of dozens of hosiery produced from 10 pounds of each seaming material if the seaming threads are altered to 80/3 needle and 50/2 looper yarn, the take-up of each thread is the same.

In the first example the counts are, in each case, 20s cotton and taking these together it will give 10s equivalent single. In the second example the resultant counts will be obtained as follows: 80/3 = 26 2/3 cotton. 50/2 = 25s single, and the resultant counts is obtained by multiplying the two threads together and dividing by their sum thus: $\frac{26\ 2/3 \times 25}{(26\ 2/3 + 25)} = 12.8$ resultant or $\frac{400}{31}$.

For the first example 10s cotton gives 10×840 yards per pound and $10 \times 840 \times 10 =$ yards in 10 pounds. The yards of seam required per dozen are 20 so that the following formula will give the number of dozens produced from this length of seaming: $\frac{10 \times 840 \times 10}{20} =$ 4200 dozens, and for the second example the formula is set out as follows: $\frac{400 \times 840 \times 10}{31 \times 20} = 5419.4$ dozens.

Thus the last given example will seam 1219.4 pairs more than the other in 10 pounds weight of each. An item such as this is of much importance in manufacturing, as it enables the manufacturer to know exactly what the position is and he can to a nicety balance his circumstances and say where economies in production can be effected. Such calculations as these sometimes reveal that a better type of seam, having a superior appearance, can actually be produced from a yarn of higher price.

The Double Lock Chain Stitch.

One of the most interesting schemes of seaming, joining and ornamenting garments and hosiery is that of the double-locked chain stitch. In its simplest form it is a two-thread seam with a needle piercing the fabric in the usual manner and with an underneath looper working below the fabric and intersecting with the thread from the needle in a kind of double chain stitch. This gives something of the firmness of the lock stitch along with something of the elasticity of the chain stitch and as the resulting seam is very valuable for knitted goods on account of the combination of those two important principles, it is largely employed for ordinary seaming. But this is only the foundation of a wonderful structure, for you can build on this by adding needles and also by ornamenting the face of the seam with a covering thread similar to what is done in the flatlock. The needle threads do not vary in amount individually between one variety of this seam and another, as their function is simply to pierce the fabric and return. The take-up of thread varies slightly with the thickness of the material being seamed and the number of stitches per inch inserted.

The great advantage of all these evolutions from a single line to a double and treble needle-line lies in the fact that a single looper can be made to do service for all and this means that the stitch making parts can be accommodated in a small space usually in a small arm and the system can be conveniently adopted for attaching ribs to circular pieces of fabric made on round frames. This is a great advantage for the bands can be seamed by slipping them 'round the arm and the whole operation is speedily performed. It also allows of a system of manufacture where the ribbed portions can be made likewise on circular machines and thus seamed or joined.

In the case of a 5-thread interlock seam, as it is termed, there are three needle threads, one looper thread and a fifth covering thread which moves to and fro over the join to hide the junction of the two pieces. This is not suited for every purpose, however, as it will be easily understood that all threads having to depend on a single looper thread underneath throw a considerable strain upon it. It is therefore desirable to select a thread which is very strong from a tensile point of view and in a thicker counts of yarn.

Example 4. Find the cost of a double-lock chain stitch seam where the unit length of seaming is 1000 yards with 40/3 cotton counts at $1.60 per pound and a take-up of 4.2 in the looper, and 60/3 cotton counts at $1.75 per pound having a take-up of 1.75 for needle.

Looper $\frac{4200 \times 160 \times 3}{840 \times 40} = 60$ cents.

Needle $\frac{1750 \times 175}{20 \times 840} = 18.2$ cents.

This gives a total of 78.2 cents per 1000 yards of seaming with this arrangement of threads.

Example 5. Find the cost of seaming the following double-lock chain stitch having two needle threads and a looper with the following particulars:

Needle 1, 60/3 cotton at $1.60 per lb. take-up =	2.2
Needle 2, 60/3 cotton at $1.60 per lb. take-up =	2.6
Looper thread 40/3 cotton at $1.50 per lb. take-up =	7.75
Total ..... =	12.55

Needle 1 $\frac{2200 \times 160}{20 \times 840} = 20.9$ cents.

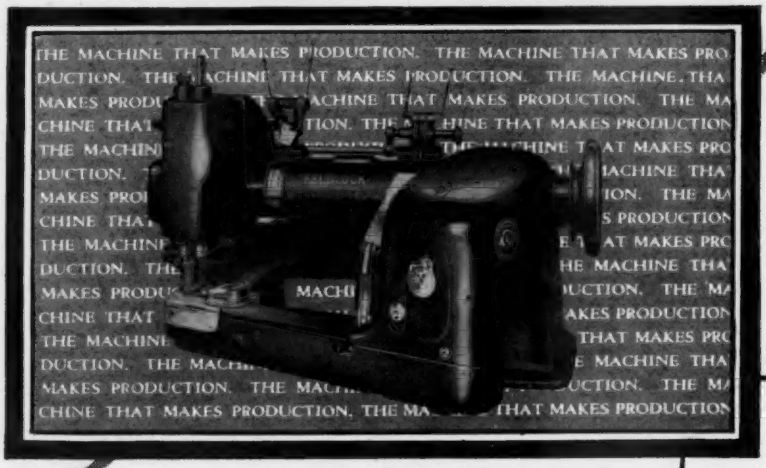
Needle 2 $\frac{2600 \times 160}{20 \times 840} = 24.7$ cents.

Looper $\frac{7750 \times 150 \times 3}{840 \times 40} = 103.8$ cents.

$20.9 + 24.7 + 103.8 = 149.4$ cents per 1000 yards of seam.

Example 6. Find the cost of seaming the following

The FELDLOCK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where a covering thread has been added to the three-thread seam:

Covering thread, 18s mercerized cotton at $1.20, take-up = 3.96
Needle 1, 60/3 cotton at $1.60 .....take-up = 2.29
Needle 2, 60/3 cotton at $1.60 .....take-up = 2.67
Looper thread, 40/3 cotton at $1.50 .....take-up = 7.75

Total ..... = 16.67

$$\text{Covering } \frac{3960 \times 120}{18 \times 840} = 31 \text{ cents.}$$

$$\text{Needle 1 } \frac{2290 \times 160}{20 \times 840} = 21.8 \text{ cents.}$$

$$\text{Needle 2 } \frac{2670 \times 160}{20 \times 840} = 25.4 \text{ cents.}$$

$$\text{Looper } \frac{7750 \times 150 \times 3}{840 \times 40} = 103.8 \text{ cents.}$$

The total of the four elements in this seam = 31 + 21.8 + 25.4 + 103.8 = 182.0 cents per 1000 yards of seam.

Example 7. Find the cost of seaming the fully developed 5-thread seam for lace attaching of hosiery garments with the following particulars which are taken from a practical test on the machine:

Covering thread, 150 deniers rayon, at $1.40, take-up = 4.96
Needle 1, 80/3 cotton at $1.75 .....take-up = 3.52
Needle 2, 80/3 cotton at $1.75 .....take-up = 2.64
Needle 3, 80/3 cotton at $1.75 .....take-up = 2.77
Looper thread, 40/3 cotton at $1.50.....take-up = 8.25

Total ..... = 22.14

5282.5 ÷ 150 denier = 35.2 equivalent cotton counts of covering thread.

$$\text{Covering thread } \frac{4960 \times 140}{35.2 \times 840} = 23.5 \text{ cents.}$$

$$\text{Needle 1 } \frac{3520 \times 175 \times 3}{840 \times 80} = 27.5 \text{ cents.}$$

$$\text{Needle 2 } \frac{2640 \times 175 \times 3}{840 \times 80} = 20.6 \text{ cents.}$$

$$\text{Needle 3 } \frac{2770 \times 175 \times 3}{840 \times 60} = 21.5 \text{ cents.}$$

$$\text{Looper } \frac{8250 \times 150 \times 3}{840 \times 40} = 110.5 \text{ cents.}$$

The total of this amounts to 203.6 cents per 1000 yards of seaming performed on this principle and it is clear from an analysis of the figures that the increased amount of the take-up required by the looper is a strong factor in the cost, as it is of thicker counts to give the necessary strength. At the same time it will be interesting to compare this with the figures obtained in the flatlock 9-thread seam which has been tested on the machine and analyzed in the same way. It should be pointed out that this seam has a considerable margin of variation and it appears that the greater the number of threads in the seam, the greater is the possibility and margin of variation. It is a mistake to assume that the cost remains the same for all varieties, as is too often done, and in the interest of accurate cost accounting it is desirable to carry out frequent factory tests with the take-up found on the machine. It will be noticed that these factors are always changing even with the same type of fabric in the same thickness and gauge.

Herewith in Example 8 are given two tests, *A* and *B* made on the flatlock machine where Test *A* gives the minimum of thread with which it has been found possible to produce the flatlock seam. In Test *B* is given another ratio of thread take-up which is very commonly met with in the industry where medium grade goods are produced. It is well known that for certain parts of articles, particularly the leg portions, the normal style of seam is found to be rather tight in action and such a seam tends to break under severe strains on the fabric particularly in strenuous wear for sports purposes. Often it is quite sufficient to increase the take-up of the thread in relation to the length of fabric seamed, but it should be clearly understood that such an adjustment makes a considerable difference in the cost of sewing and seaming materials absorbed in the making of such goods and it is an item which should be added to the cost of any articles where such special treatment has to be accorded.

On the other hand, the manufacturer may decide that this method of increasing the elasticity is rather prodigal of thread and may choose another type of seam which is, in some respects, less strong in a tensile way but which possesses greater inherent elasticity which can be utilized before the strain reaches the threads of the seam proper. This elasticity should, theoretically, be of such an amount as will approach the elasticity of the knitted fabric itself, because when this is exhausted then there is a chance that the strain will be borne by the threads of the seam plus the threads in the ground fabric.

Example 8. Compare the costs of the following two tests *A* and *B* of a flatlock seam where the yarns are the same in both cases, but where the take-up of thread is increased in the second test. Needle threads are composed of 60/3 cotton at $1.50 per pound, looper thread occurs in 28s cotton counts and costs 70 cents, while the covering cotton thread is in 18s cotton at 50 cents. The respective take-ups of the two tests are given as follows:

	Test A	*Test B*
4 needle threads.....	7 total	10 total
4 looper threads.....	20 total	26 total
1 covering thread.....	8	10.5
	Total = 35	Total = 46.5

Test A. Needles $\frac{7000 \times 150}{20 \times 840} = 62.5$ cents.

Loopers $\frac{20{,}000 \times 70}{28 \times 840} = 59.5$ cents.

Covering thread $\frac{8000 \times 50}{18 \times 840} = 26.4$ cents.

Total cost = 62.5 + 59.5 + 26.4 = 148.4 cents per 1000 yards of seam.

Test B. Needles $\frac{10{,}000 \times 150}{20 \times 840} = 89.3$ cents.

Loopers $\frac{26{,}000 \times 70}{28 \times 840} = 77.3$ cents.

Covering thread $\frac{10{,}500 \times 50}{18 \times 840} = 34.7$ cents.

Total cost = 89.3 + 77.3 + 34.7 = 201.3 cents per 1000 yards of seam.

Taking the difference in cost between those two tests, 201.3 — 148.4 = 52.9, it is found that test *A* works out at 52.9 cents per 1000 yards of seam less than test *B*. If we require to figure out the actual difference in cost per dozen garments, then it is necessary to measure the amount of seaming provided per dozen which is arrived at by

measuring all the seamed portions and making a suitable allowance for the starting and finishing of the seam. Whenever it is put on a fresh piece of fabric the loss is considerable as it requires some little time for the flat-lock seam to get into its stride on the fabric, and there is always a little run over in sewn material in getting the fabric free after the seaming is complete. In a set of garments having 100 yards of seaming, for example, the difference per dozen garments between tests *A* and *B* would amount to 5.29 cents.

Knitted Lamp Shades for Holiday Sales.

The holiday season has brought forth several new ideas from the producers of knitted fabrics and hosiery. None of us would have thought that a manufacturer of hosiery would stop to bring out a circular lamp shade, which is stretched over either a wire frame or a parchment shade and when over a light makes a very attractive decoration.

These novelties are on the market although the idea is entirely new and shown for first time within the past month. They are now in retailers' hands and from the number of admirers it is believed it will be a good holiday number. The shade is not costly when made of either rayon or silk and in metal colors or light shades is really very attractive. In some cases they are hand decorated, while in others it has been suggested that the consumer paint or applique it to suit their own individual idea of decorations. Made in different sizes it promises to be a source of trade that will keep some mills busy for the holiday trade after their regular line of hosiery is completed for the season and now a few jobbers are wondering if they can't figure out some novelty for the dull Spring season also, but admit that the Winter season following the Fall business and just before the Spring business starts is the dullest season of the year.

Another manufacturer has been producing a line of doll's dresses and suits for the holiday trade, also an idea which appears to have made a "hit" with the sellers. They are easily put on the doll and can be made for little money, using odds and ends of colors, materials, etc., which might otherwise be considered waste. This is particularly true of makers of outer apparel, sweaters, coats, etc., which have also made doll's clothes for this season, never having believed there would be any profit before.

For outerwear some manufacturers have found bathing suits of prominent colors becoming active for the southern trade. It was said that some worsted and rayon plaids were receiving particular attention at the close, although the supplies and demand had been limited. But indications point toward a good business in this sports type of bathing suit for the Spring. The sports idea appears to have "taken hold" of the sellers and the consumers, and the novelty bathing suit, made in the one and two piece effects, although with a slightly lengthened skirt, are moving in greater volume than anticipated. In combination with the sports bathing suit is worn a beach wrap or coat of plain material, frequently lined with the same material as the suit. In some cases a cape coat effect has been featured, and while it has not been definitely accepted, there are many of the ultra-fashionables that are interested, and the producer is making up a few numbers to try them out.

Another bathing suit accessory is the hosiery which is being advocated and made in unusual lengths and while in some cases they are "rolled" at the knee, in others they disappear under the bathing suit. This style is being featured for the conservative women who have demanded something different in bathing suits, although admitted that all of the younger women would not be likely to adopt them, but at the same time, it was suggested that they might be made "fashionable" and the demure type, which appears to be getting more popular among the younger women, are likely to use such an article for the Summer season. At least, the producers believe it is worth while trying it out for the Winter resort season.

Buyers of "skating" garments are not buying in their usual volume, claiming the season is too late to do a big business and are afraid of a mild Winter in this district.

Trends in the Full-Fashioned Industry.

Two movements, both in their incipiency, designed to improve conditions for hosiery manufacturers, are being discussed in a quiet way. One contemplates an organization of full-fashioned mills for adopting universal standards on which to base prices. If carried to its culmination, length, gauge and number of courses would be used for price differentiation, and necessarily there would be an attempt to standardize prices for chiffons and heavier weights.

The movement seems to have been undertaken by an attorney at law, who is reported having received only meager encouragement. Most manufacturers say they prefer to be left to manage their business in their own way, holding that prices cannot be regulated by organization so long as the law of supply and demand remains unrepealed. However, there are manufacturers who would enter a league for bringing about a guarantee of the gauge in which a stocking is knitted. This, it is held, would have the effect of making it hazardous to knit up coarse gauge to represent fine and so representing it to not well informed buyers. But it probably would meet with the same resistance from major elements as did the move to compel manufacturers to mark seconds and irregulars as such. Most of those who did so for a time gave it up, as seconds unmarked fetch a higher price than the marked. Buyers are willing to pay more for unidentified irregulars, so that the seller profits in two ways, in that he is spared the cost of stamping irregulars.

There has been some discussion of the expediency of taking action for eliminating a number of struggling hosiery mills in Pennsylvania. It is represented they are making no money for themselves and make for irregularity of prices to the serious hurt of mills which under present conditions must operate on a dangerously narrow margin of profit. The proposal strikes a snag every time it is discussed, for it is found no manufacturer is willing to scrap machinery, while so long as the equipment remained, no merger could prevent it becoming active. So it appears both movements referred are likely to end about where they started, say those who had given them some consideration.

You've got to grow as your customers grow or your territory grows. Otherwise a more willing competitor will take your place.

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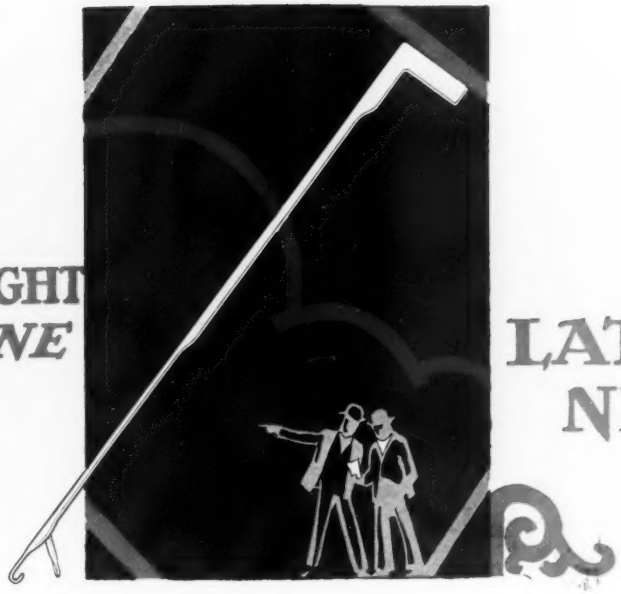

Latch needles are small in size. Perhaps their very smallness makes them seem comparatively insignificant in the scheme of production.

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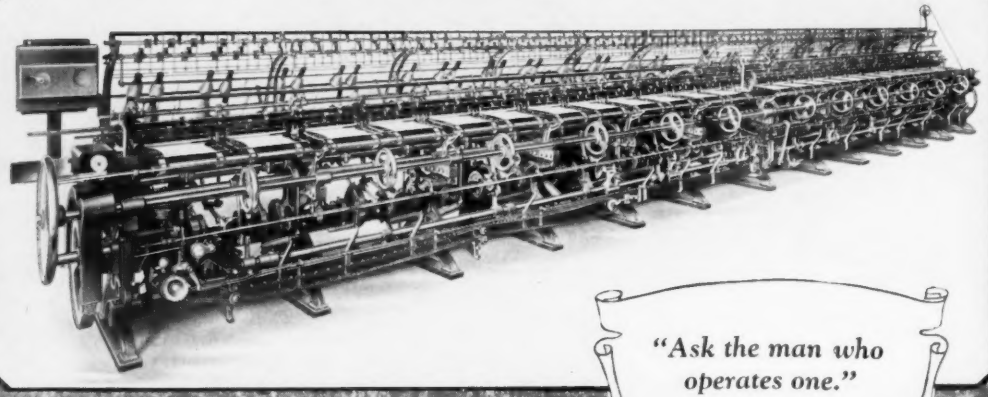


"Ask the man who operates one."

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packng and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Cutting Shoulder Straps and Gussets on Rayon Underwear.

EDITOR COTTON:

Since the manufacture of knitted rayon underwear has become so large, and is developing more or less in the South, perhaps if you could secure from the readers of "Knitting Kinks" who make those goods some information as to their practices, it might be of general interest.

One phase I think of now, that it might be interesting to discuss, would be an outline of the practice of different mills as to the most economical ways of cutting shoulder straps and gussets. There is a diversity if practice as to the methods for doing this, and I feel sure that those making such garments would be glad to see some of the ideas of other mills along this line.

CONTRIBUTOR NO. 3018.

Preventing Oil Spots.

EDITOR COTTON:

In a recent number of COTTON I noticed that one of the readers of "Knitting Kinks" was having difficulty with oil spots, and that you published a reply to this question in the October number.

I wish to say that we are using 260 Model K machines making silk and mercerized goods, and that in my opinion there is no way to prevent oil spots when filling up the machine with new needles.

I take care of this by holding my oil streaks and using them for dark shades. I never have any trouble with oil spots except when I fill up the machine with new needles and sinkers. I have my machine oiled twice a day. I find that by using the proper grade of non-fluid oil, which I have used for the past 15 years, that it is the best method for minimizing these oil streaks. N. E. (GA.)

Stripping Developed Black From Silk Hose.

EDITOR COTTON:

Recently you published a question from a subscriber asking how a developed black could best be stripped from silk hosiery.

The stripping of developed black on silk and mercerized hosiery presents difficult problems in securing a level stripping agent, whereby the entire fiber is stripped evenly. To find a product that will aid the stripping and still protect the fibers is also difficult, for the shorter the period of stripping, the less will be the deterioration of the fibers.

There is quite a variance among developed blacks used on hosiery, as to the property of being stripped to a base suitable for re-dyeing . I will give two formulae which offer fairly composite methods of stripping developed black on silk, rayon, mercerized, and hose containing wool.

The first is:

For 100 Pounds of Material.

8 to 10 pounds Protectol II Double Powder.

4 to 7 pounds soda ash.

Make a paste of these with Monopole oil, then add hot water to a solution. Add liquid to bath, enter goods to be stripped and run 10 to 20 minutes. Then, 10 to 15 pounds hydrosulphite concentrated powder, either pasted up or add the powder in gradually. Run 30 to 45 minutes at a boil, drain off and give a wash at 120 degrees F.

The hosiery should be stripped to such a light gray that they can be re-dyed in the popular shades of the season.

Another good formula is:

For 100 Pounds of Material.

5 to 10 pounds Protectol II Double Powder, pasted with Monopole oil and hot water. Add to the stripping bath, enter material, run 10 to 20 minutes at 180-200 degrees F. Add slowly 3 to 6 pounds Rongalite CL powder. Run at 200 degrees F. for 20 to 40 minutes, drain, wash at 120 degrees F. and then cold.

These methods and percentages can be varied to suit local conditions as to water, types of hosiery, and dyeing machines used—whether paddle or rotary.

The Protectol protects the silk, wool and rayon fibers during the chemical action of stripping, and hastens the stripping action of the two stripping agents—hydrosulphite and Rongalite CL. The latter is a leuco form of Rongalite and does not need an acid but can be stripped in an alkali bath if necessary.

D.P.(N.C.)

EDITOR COTTON:

I noted the inquiry from your subscriber, who sent a sample hose and wanted to know how the developed black

could be stripped from it.

He did not state what developer he used to develop his black, but I believe it to be one of the Diamine developers on account of the depth of the black. It will not be easy to strip it to a clear white. Those developers will still be on the goods after the color has been stripped and the result will be a dirty yellow. He will be able to dye the hosiery only in a tan, French nude or colors on that line, if he has a good dyer. I will give you several ways he might try, and then select the one doing the best work for him.

Stripping with Rongalite L Powder—use 2 to 4 per cent. Put the goods in the machine, enter the water, raise to a boil and add the Rongalite L Powder right into the bath. Work for 30 minutes and give one warm and one cold rinse. Whiz, dress and re-dye.

Stripping with Decolorite—use from 5 to 8 per cent, which should be sifted in the bath or dissolved in a pail of hot water, not boiling. Prepare as before, but enter the Decolorite at no higher than 160 degrees F., then enter an equal amount of acetic acid and boil for 30 minutes.

There are dyers who get good strippings using hydrosulphite. I have tried it on developed blacks but the results were not good, while I have gotten good results with the methods described, except, as I said before, the developer left a stain on the goods. It can be covered very evenly, however, by dyeing in a medium-hued shade.

I would suggest further if the stripping is done in nets, which is the best way, that no more than two dozens be put in each bag, to insure good and easy circulation to the goods to be stripped. The stripping takes place so quickly that if too many stockings are enclosed in the bags the results are likely to be very unsatisfactory.

W. K.(TENN.)

EDITOR COTTON:

I note in a recent issue of COTTON, in the "Knitting Kinks" department, "W. G. (Cal.)" requests information on stripping developed color from silk hosiery.

The writer has found that the ordinary hydrosulphite stripping agents used in combination with sodium bisulphite proved to be very effective as a stripping agent for developed black, especially on silk hosiery.

This method of stripping would call for approximately 5 per cent of one of the zinc formaldehyde hydrosulphites and 2½ to 3 per cent of powdered sodium bisulphite. The stockings would be entered into the stripping tub and brought to a boil. After the hosiery came to a boil the dissolved hydrosulphites would be added and then the dissolved sodium bisulphites. The bath is allowed to boil for approximately three-quarters of an hour when the color will be stripped to a pinkish-brown shade.

The pinkish-brown shade or yellowish-brown shade remaining on the silk and cotton is a deposit of impurities from the dyestuff which is fairly soluble in acetic acid.

After the stripped black has been fairly washed and rinsed the goods are then entered into an acetic acid bath and are again brought to a boil which removes a further quantity of the coloring matter. The stockings are then washed and given a suitable rinsing bath and a softening agent such as one of the Sulfols.

CONTRIBUTOR NO. 861.

Don't make customers of your friends, but make friends of your customers.

Computing Costs on Full-Fashioned Hosiery.

EDITOR COTTON:

In your June edition, under "Knitting Kinks," "Contributor No. 182" requested a method of computing costs on full-fashioned hosiery. It is doubtful if such costs can be computed in a superficial manner and produce very accurate or very dependable results.

It is essential to any manufacturing business, of course, that records of production be compiled in conjunction with the regular accounting records. From this information certain ideas may be obtained as to the individual items of cost of manufacture. Such figures, however, are very indefinite, inasmuch as there are numerous variable characteristics by which these individual items are affected.

In the instant case the first matter to be considered in the refinement of the available data is that of ascertaining the actual weight of the yarn being used in the finished stocking. The amount of weight added in the process of winding (usually about three per cent) can be ascertained with a fair degree of accuracy by tests at frequent intervals, that is by weighing the yarn before and after winding. The amount of yarn lost in waste can be ascertained in different ways. It is possible to weigh the waste obtained from topping, which is the point at which most of this loss occurs. However, by making test runs of given quantities of yarn, noting the production obtained and the loss suffered in waste and after making allowance for weight added in bobbin winding, it is possible to establish a reasonably accurate standard of yarn cost for each grade of stocking manufactured. Tests of this kind should also be made at frequent intervals, the weight of the finished stockings being taken prior to the process of looping.

The treatment of seconds and irregulars depends upon the policy of the mill. If seconds can be sold to employees or accommodation customers at regular factory selling prices, then no further consideration need be given them. However, if both seconds and irregulars must be disposed of at a sacrifice, this loss should be absorbed in the cost of manufacturing. The percentage of seconds and irregulars obtained in each grade over a period of time should be ascertained and the loss suffered should be absorbed in the manufacturing costs of the corresponding numbers.

The cost of re-dyeing is another item outside of the regular factors of cost which must be considered. Over a period of time it is possible to arrive at a percentage of re-dyes which will hold fairly constant. The resulting cost can also be absorbed in the cost of manufacturing.

Thus the variable characteristics may be standardized and absorbed in the regular costs of production. Productive labor being largely piece-work at fixed rates, the labor cost presents little or no difficulty. The matter of overhead or "spread" is a problem which can scarcely be treated in detail in a limited space. However, speaking generally, the anticipation of overhead rates on estimated expenses as applied to estimated production is preferable to using rates computed on past operations. History, in costs, is a dead issue except as it may be used as the basis of estimates for the future. Combining the three factors of material, labor and overhead, after having subjected them to refinement, a cost of manufacturing will be obtained which will permit of a fair degree of accuracy.

With the ordinary records now in vogue throughout the industry it is possible to obtain some idea of the cost of manufacturing. Since further refinement, as suggested

here, permits of more accurate results, then the remaining requisite is a cost which can be proven. This can be obtained with more facility than might at first be supposed. By maintaining financial records and records of production, the foundations of an adequate costing method have been laid. Making tests to establish averages and estimates to establish production costs, carries the work still further and forms a basis for predetermined or standard costs. The matter of extending and proving the costs based on established standards becomes routine work and by the co-ordination of these statistics with the regular accounting records, current and accurate costs will be available at all times as well as accurate profit and loss figures at regular, frequent intervals.

Accurate costs, in themselves, are highly important and would alone justify the installation of a costing system. However, in addition to this, the comparison of standards and estimates with actual results offers a measure of efficiency both in the productive and administrative functions of the business.

Scientific management of production and executive control of operations are essential in any highly competitive manufacturing business and yet they are terms which express "Utopian" ideals to most manufacturers. Actually, however, the cost and effort involved in establishing these functions are so insignificant in the light of the results obtained that no manufacturer can help but profit by them.

The day of guess-work has passed. The use of accurate, scientific methods has become essential to the continued success of any business. H. P. (PA.)

Kinks and Suggestions on the Model K Machine.

EDITOR COTTON:

In concluding my letters on the model K machine I am going to inquire if there are not other readers who keep note books and can and will write letters to "Knitting Kinks telling of their experiences. There are many makes and types of machines in use and a collection of such notes from practical men on any and all these machines will be valuable to me and I believe to others. I will now present my final notes.

Belt Shifter Drum Friction.

The purpose of this friction is to keep the main drum from over-throwing, when going through the various changes. The leather on this friction is held in place by two brass pins. When the leather gets worn down to these brass pins, little friction results, causing the machine to break needles on the set-up and the other changes.

The remedy is to grind the brass pines down a little so that they are below the level of the top of the leather.

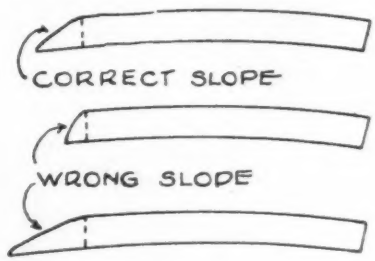
When breakage of needles result, this is one of the first things to look for.

The Leading Double Sole Cam.

The leading double sole cam brings the splicing yarn out on the coming-out side of the foot. The slope on this cam has a great deal to do with getting the splicing thread in a straight line. As a general rule machinists go to two extremes, one is in getting too steep a slope, and the other is too gradual a slope.

Too steep a slope on this cam will result in the splicing yarn over-throwing; the other disadvantage being the pounding which the thrust bar, which works on this cam, receives, sometimes resulting in rapid wear to the splicing cam and breakage of the thrust bar. Too gradual a slope results in the splicing yarn not coming out quick enough to get on the proper needle, resulting of course in splicing trouble.

The slope on this cam should be between these two extremes for the best results. The illustration gives an idea of the right and wrong methods.



The Right and Left Bushings.

The right bushing No. 6009 and the left bushing No. 6014, should be kept well oiled. The main shaft rides through these bushings, so if they become dry considerable play will result in the shaft, possibly burning these out, which will result in the machine sticking and sometimes necessitating the taking of the main shaft out of the machine. In order to save future trouble, it is advisable to keep these well oiled.

The Ratchet Pawl Lifter.

This ratchet pawl lifter performs two functions on the machine, one of which is to work on the changing links and the other is to hold the main pawl out of action during the time the machine is not going through any changes. The back and forth motion of the main pawl as it rides over the ratchet gradually wears the ratchet down on the side until the main pawl begins slipping off, of course causing trouble.

When this becomes evident and the machine gives trouble, this can be overcome by fitting the right side of the main pawl so that it can be swung to the left a little. If this cannot be done within reason, the thing to do is to fit a new rachet.

Upper Guide Plate No. 7041.

The upper guide plate holds the thrust bars in position as they ride over the drum cams. This guide plate has walls inserted in slots on the underneath side, held in place by another plate. These walls are renewable.

The walls break every once in a while and when this occurs it sometimes causes the thrust bars to bind.

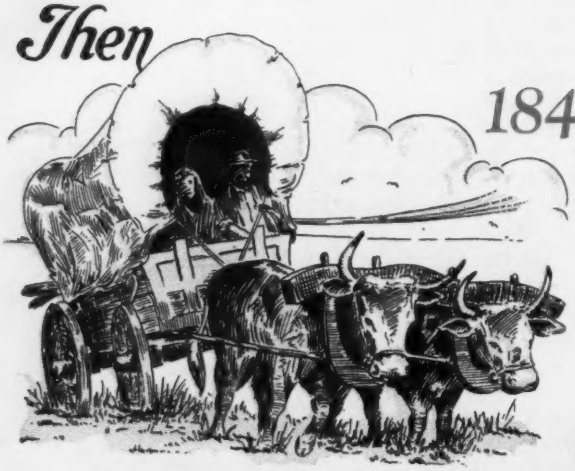
The first wall on the left side breaks more frequently than the others, due to the pounding which the splicing thrust bar receives.

Sinker Clamp No. 7109.

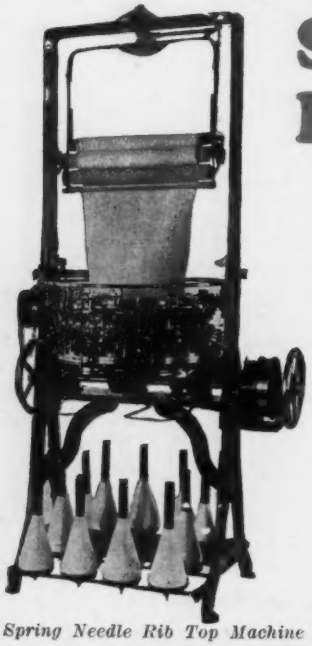
The purpose of the sinker cap clamp is to hold the sinker top to the outside sinker ring. These clamps should be set so that there is about a sixteenth of an inch of play. If more than this is allowed, jumping of the top will result when the machine is in the reciprocating motion, causing more trouble.

Outside Sinker Ring Clamps No. 7356.

The outside sinker ring clamps hold the outside sinker ring to the cylinder. On the older type machines these clamps become loose, resulting of course in the outside sinker ring becoming loose and causing many imperfections.



Cooper Spring Needle Rib Knitting Machinery



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This is one of the main causes of machine trouble and should be checked over. On the newer type machines the makers have a clamp which is twice as large as the older one, resulting in a better grip. It would be of advantage to replace the older type clamps with the newer ones.

Yarn Changing Finger Spring Holder No. 7019.

The springs from the yarn changing fingers are fastened to the yarn changing finger spring holder instead of shortening the springs to tighten the tension of the throw of the finger. This spring holder is adjustable. All that is necessary is to move it around to the tension desired. This is a very handy adjustment.

The hook on the end of the finger spring which fastens on to the holder should be made in such a way that it will not come off. This is something that is not done as a general rule, and will often result in future trouble.

Switch Cam No. 6540.

The switch cam draws the long butt and medium needles out of action when transferring on the reciprocating motion.

In time the switch cam becomes worn, resulting in breakage of the butts of the needles. As the switch cam drops to raise the butts of the needles, there is supposed to be just enough space for the short butt needles to ride by, picking up the medium and long butts only.

If there is more space than this, the medium butt needles, being but a trifle longer than the short butts, are picked up only half way causing them to break. This play may be due to the wear of the switch cam in which case it can be renewed. It also may be caused by the bracket which holds the switch cam. This bracket is held in place by two screws. The holes which these two screws pass through become worn, gradually allowing the bracket to slip away from the cylinder, resulting in the same trouble.

This can generally be overcome by tapping the bracket closer to the cylinder and tightening the screws with a heavy screw driver. Sometimes the roller on the bracket becomes loose or becomes worn, resulting in the same thing. Button hole trouble in the corner of the gores of the heel and toe is due sometimes to this trouble.

Guard Cam No. 7949.

One of the purposes of the guard cam is to prevent the butts of the cylinder needles from over-throwing, resulting in the butts striking the right point of the upper center cam, breaking them off.

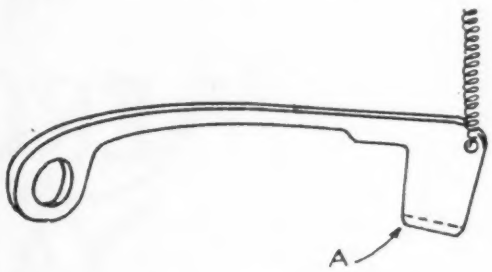
The level of this guard cam is also very important. If the guard cam lies too low, the butts of the cylinder needles will of course break off, due to the narrow passage. If the guard cam lies too high, breakage of the needles on the heel and toe will result also.

One of the purposes of the guard cam, when on the heel and toe, is to draw the top layer of needles, which have the cylinder jacks underneath them, to the level of the top of the right hand stitch cam. If the guard cam does not pull the butts of the needles down to this level, at times, two needles will attempt to get on the right hand picker, resulting or course in one of the needles being drawn up half way, and jamming into the upper center cam. Also be careful not to get this guard cam too far forward, as this will cause it to rub the face of the needle cylinder, marring the walls. If these things are taken into consideration little trouble will result along this line.

Fitting a Medium High Cam No. 8304.

The medium high cam is kind of a puzzler to fit sometimes, although if gone about in the proper manner, little trouble should be had. For a Model K machine these cams, as they come from the factory are a little too long, as is shown in the illustration.

Put the machine on the heel or toe; insert this cam with the screw, but without the spring. Now when this cam is all the way in toward the cylinder, note how far the end of this cam misses the short butt needles. If it hits the short butt needles; grind enough off this end as indicated by the dotted line *A* in the sketch, so that when it is all the way



in there is just enough room for the medium butt needles to ride by, no more, no less. This is very important. After it is done, take the machine off the heel or toe, and put the machine on splicing. You will probably find it is necessary to bend the end of this cam, either up or down, so that the long butt needles will ride down without too much friction. If this is not done, considerable damage to the butts of the needles will result. Then insert the spring, and adjust the throw of the long butt needles so that they will not be drawn down too low, or not low enough.

Up-Pick Connecting Rod No. 7095.

When on the heel and toe the up-pick connecting rod works the pickers. On the newer machines this rod is adjustable and can be set where wanted. As one picker raises its needle out of action, this rod pulls the other picker into action, and so forth. This back and forth motion is kept up until the machine transfers off the reciprocating motion. On the one piece connecting rod, on the older machines, it is sometimes necessary to shorten the length by bending in the center. This is due to the wear the pickers and connecting rod receives, resulting in picker trouble of various kinds.

The Clutch Fork No. 6026.

The purpose of the clutch fork with its roller is to shift the cluth bracket from straight knitting to reciprocating and vice versa. This clutch fork is adjustable up and down, and should be set so that the roller moves freely without undue friction.

Very little trouble is had with this fork if it is kept adjusted properly.

CONTRIBUTOR NO. 445.

Topping Back After Press-Offs.

EDITOR COTTON:

After you published our letter in the May issue of COTTON, several mills were kind enough to answer our question, which was with reference to whether it is better to back-wind yarn or top back, in the event of a press-off on full-fashioned work. Their answers appeared in the June issue. I want to express my thanks to these men, and say to them and the other readers that we have gone into the matter

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pretty thoroughly since reading their replies, and have concluded that it is practically essential to top back because the seconds run up so high in trying to use the yarn after it was back-wound. A very large majority of the press-offs occur after the narrowing marks are past and we top back everything past this point. The few we have ahead of the narrowing marks we still top back and do the best we can with them. CONTRIBUTOR No. 181.

Keeping Silk Moist on Full Fashioned Work.

EDITOR COTTON:

In connection with your plans to cover full-fashioned work in your "Knitting Kinks," I think this idea is entirely appropriate, in view of the unquestioned growth of full-fashioned for ladies' work, and also because of the rapidity with which this branch is being developed in the South.

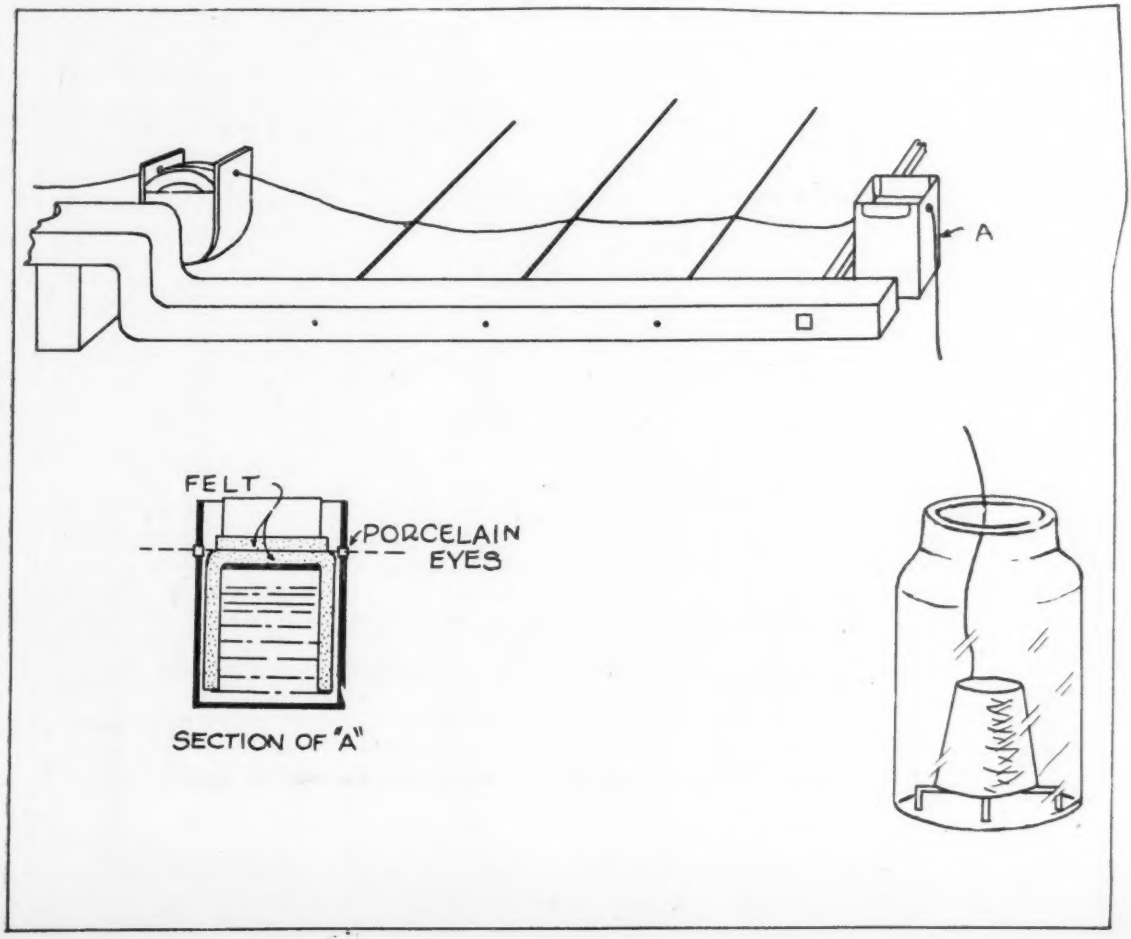
Most of the new southern plants are being started by manufacturers who have had experience in seamless manufacture, and no doubt they are finding out that there are numerous problems they never encountered in their previous work. That, at least was our own experience, when we passed through this change, and even now we have our problems.

One of the most common problems which presents itself to the new man on full-fashioned is that of "sleazy" knitting. It's hard for a seamless man to realize the importance of having sufficient moisture in the silk when knitting, and an improperly conditioned yarn is one of the chief causes of sleazy work.

When we first started our full-fashioned department, I, new at the game, conceived the idea of eliminating the wet cones or winders, and of using the silk direct from the throwsters' cones by means of special arrangements on the back of the knitting machine for performing this work. But after exhausting much patience, and the use of much time and effort, I came back to the conclusion that it couldn't be done. That is one place I must apologize to the German. His method of wet coning is more satisfactory than anything we could devise as a substitute therefor.

I am giving you this information because lately, I have learned, a number of men going into full-fashioned have the same idea I did, and are devising all sorts of moistening arrangements for the knitting machine. I am honest in saying, however, that I think we tried practically every method I have seen so far, including the plan of using two felts—one to put the moisture in, and the second to remove the excess. If any of these men came to my plant I would show them a whole truck-load of junk, discarded after our experiments, as a monument to our mis-directed effort in this connection.

It is possible that your readers may be interested in just what method we did adopt for the purpose of conditioning the silk, and so I will describe it briefly.



First, we use the regular Leesona winders, on which we pass the silk through a soaking solution while re-winding it onto cones for the knitting machine. Leaving these winders, the conditioned cones are placed in conditioning cases, for the purpose of retaining the moisture content until the yarns are carried to the knitting frame. The arrangement on the knitting machine is shown, roughly, in the accompanying sketch.

Instead of using a glass case to hold all yarns, we put the silk only into a round confectionery jar. Our knitting room humidity is controlled artificially. The silk cone inside the jar rests on two crossed pieces of bent tin, which keep it above any water which may accumulate in the bottom of the jar. A zinc top with a porcelain eye in the center is used on the jar, and the yarn is threaded through this up to the small can containing the conditioning solution. The construction of this we developed ourselves. One can is used for each separate end of silk yarn, or two to the section. It is about 3 x 3½ inches by about 2 inches wide. The felt over which the yarn passes rests on a supporting bracket which has flanged sides that fit over the sides of the can. The ends of the felt extend down into the solution. The yarn passes over this felt, giving a positive drag for three inches in the solution. To increase the effectiveness, we place a flat piece of felt on top of the yarn, which increases the contact and gives us a better conditioned yarn.

The next attachment through which the yarn passes on its way to the snappers is used, in the case of the silk yarn, only as a guide. However, each cotton yarn is also passed through one of these, in which case they serve as a tension arrangement, being regulated by changing the height of the curved piece of felt.

In running silk yarn on a full-fashioned machine, my experience is that it is best to give it sufficient moisture, and also to run it with as little tension as possible. Too much tension will, among other things, cause excessive wear in the thin steel tube in the yarn carrier, which must be changed frequently anyhow, and sharp edges and damaged silk will result. If the yarn is not uniformly and adequately moistened it is impossible to get a continuously even stitch. To secure this, the yarn must be pliable and resilient at all times, so that the sinkers and dividers can do their work properly. CONTRIBUTOR No. 1501.

Evening Up Instep Stitches.

EDITOR COTTON:

Mill men frequently have trouble with an uneven stitch on work from the Banner machine between the leg and the foot, due to the fact that there are separate adjustments, one for the leg and one for the foot, and it is necessary to be careful to secure the same stitch in the foot, after knitting the heel as was knit in the leg. I have a method which I think will get away from the trouble! it is a time saver and makes the stitch the same in the foot as in the leg. Here it is:

Take a piece of flat tool steel, ½ inch wide, 1¾ inches long and 1/16 inch thick, and drill two holes in it and fasten it on to the fashion wheel right after it drops off of the heel. There is a cam there which is low on the inside and high on the outside. The reason for this is that the foot adjustment goes in action on the outside, or high side, while the inside or low side allows the leg adjustment to drop out of action. By putting this piece of steel on the low place, it builds the cam up even, therefore, the fixer takes the foot adjustment screw and pin out of the fashion bracket, leaving only the leg and heel and toe adjustment in the bracket.

Now that the foot cam has been built up, it is the same height as the leg cam, which then puts the leg adjustment in action on the foot also.

It should be borne in mind when putting this piece on the foot cam wheel to make it the same height as the leg; therefore, the one adjustment, the leg adjustment, will control the stitch from the top to the heel and from the heel to the extended toe.

It might be advisable to take the fashion wheel and place it in a lathe, and after it is lined up accurately, have the wheel turn in the lathe to see whether the cam is too high or too low on the foot.

I might advise that the piece of steel used in building up the foot cam be a little thicker than I mentioned. Then have it cut down in the lathe to the same height all around so that it will be a first-class job and I believe uneven stitches will be a thing of the past.

I would be glad to have some readers try this on one machine and let us know through COTTON how it works out.

CONTRIBUTOR No. 788.

Believes in Specializing Departments.

EDITOR COTTON:

To manufacture knitted textiles it is necessary to begin with the raw materials such as cotton, wool, silk, rayon and various others, proceeding step by step through the many processes such as spinning, throwing, mercerizing, dyeing, etc., thereby making it available for the smaller plants to convert into a finished product.

One of the first principles, so often neglected in smaller mills, is an accurate cost system. Not one full of red tape, making it laborious and costly, but one whereby the shrinkage, materials, labor, overhead, light, heat, power, insurance, selling, executive, interest on investment and profit can be readily ascertained. One of the commonest errors is not to know the actual cost. In this manner comes underselling of the manufactured product, producing bankruptcy for the mill and establishing a hardship for its competitors; in many instances forcing others to compete. This unusual practice has demoralized markets, caused unrest in labor, closed factories and has sometimes taken the confidence out of business.

Another principle often involved is the high price of raw materials, especially cotton. As long as cotton is high in price or in close proximity to silk, rayon and wool the knitted textile industry will never thrive as of old. The cost of products made from cotton so nearly approaching rayon and wool and the decided contrast between them to the eye of the average buying individual, almost eliminates certain cotton articles from the counter. However, since the prospect of cheaper cotton is not in sight, the most logical plan is a change of operation to keep the mills in operation.

Specializing is the key to overcome the heretofore encountered obstacles. Why not specialize on each operation regardless of where or at what stage the manufacturing begins. Every department should show a profit; let the various operations or departments be handled or

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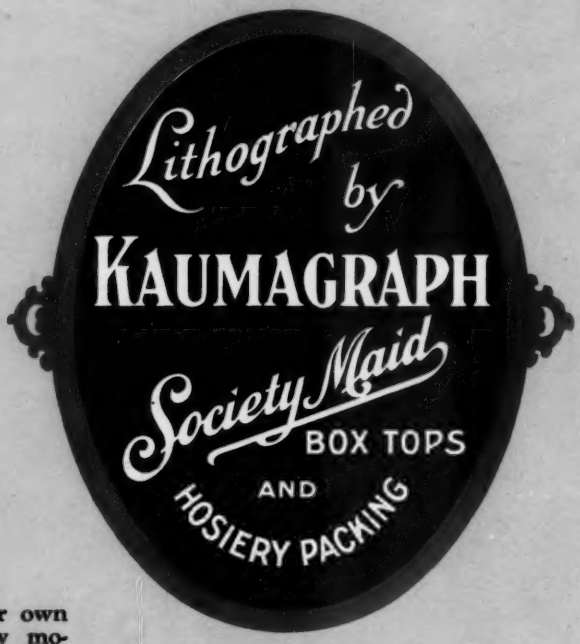

GET away from your own business for a few moments and step into a drug store—any drug store. Ask the proprietor to tell you the most important factor in selling face powder. Is it quality? Only partially. Is it advertising? To a certain degree. But even more important than either of these is the package that contains the powder.

In the hosiery business, too, the package is becoming an increasingly important sales factor. Manufacturers, selling agents and jobbers have learned from experience that fashionable hosiery sells faster when it *looks* fashionable—when it looks as fashionable in the box as on the foot.

A great many of the more successful box wraps and hosiery packing that are helping to sell hosiery today, are *lithographed by Kaumagraph.*

In most cases, the design was conceived by Kaumagraph's Art Service Department. In many cases the dependable quality of Kaumagraph's Lithographic work has made possible the use of delicate colors hitherto precarious to use. In every case, box wraps and hosiery packing when "lithographed by Kaumagraph" have become a more important factor in selling the goods. Write for full information.

The Society Maid Box Top is an excellent specimen of a package that helps sell the hosiery. All Society Maid Box Wraps are "Lithographed by Kaumagraph."

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managed by entirely independent executives in the factory or on the outside by contract work by disinterested parties; not subjected to the control of the next department or the management, even should several departments be under the same roof or ownership. It is a known fact that more can be accomplished by specializing or contracting in one thing than by dabbling in many. That is why Henry Ford can manufacture so cheaply.

To give a concrete illustration: Take, for example, an underwear plant manufacturing men's wear. Suppose they desired to manufacture children's underwear because the market was overstocked with men's wear. Naturally they would be obliged to buy different machinery for one or more departments because their machinery would not be suitable. Instead of doing this, let them advertise for exactly what they require and buy that material. In this manner they will know exactly what it will cost and in each instance it will cost less than they could produce it.

This plant could then manufacture their desired product into finished garments, in each instance knowing the cost. They could also utilize their idle machinery to specialize for another plant whose market was over-supplied. Bear in mind that should the market be over-supplied in men's wear, this same machinery being idle on account of this particular plant manufacturing children's wear, could be used to specialize in bathing suits or even rayon fabric for another mill. In this manner each in turn would be specializers or contractors, cooperating with each other and earning a profit, at the same time being independent one from the other. This would entirely eliminate that very common practice of underselling each other.

One of the greatest difficulties many mills experience is that their plants are designed to manufacture one or several products, and when the market is stagnant or closed, they are obliged to either close or invest a large amount of additional capital for new machinery to meet the then present demand. This, in many instances, cannot be done.

There is enough machinery in our country to supply any requirements except in rare instances. To prove this, some of the new stitches or patterns are over 20 years old, yet new today. It is the old story, "history repeats itself." Men have apparently successfully managed many plants for years and years, yet it took a visitor or stranger only a moment, or a glance, while being shown through the plant, to see how some operation was being carried on crudely or laboriously. It is for these reasons that specializers or contractors seem to be the better method, since cheaper raw materials are not available and labor is high.

P. B. R. (PA.)

Some Knitted Novelties.

Among the many suggestions for the new lines of hosiery has been what the producer has called the "storm boot" which consists of an inner short stocking for the "flapper" or determined young or older women who refuse to wear overshoes as a protection against the cold or wet weather. This boot is made in flesh color of silk, rayon or worsted and can be used with any color or type of stocking without showing through, nor does it make one look any larger, an advantage with the "large" ladies.

The boot is said to be from twelve to sixteen inches in length and is made with a strap on the foot to hold it in place. It extends up to the knee or where the skirt begins. The different lengths are for the small or tall women.

While each buyer of hosiery is not to be urged to purchase a pair of these inner boots with each pair of stockings, the manufacturer suggests that each woman have two pairs since in the colder climates once they put these stockings on under their chiffon hose, it will be impractical to change them or to leave them, off, so it was suggested that there be two pair to change with. It was said these boots would wear for the entire season, since there would be no strain on them. They are made close fitting, but with unusual stretching qualities in order to fit closely and not have to be fastened at any place.

The "half-top" hose is another novelty shown on the market which is made of two tones or colors. One striking combination was red and black, the lower part black, the upper red, worn with a dress matching the upper part of the stocking. When worn with matching garments the effect is not so striking and appears to be taking hold of the trade at the present time, in strong color combinations with black for the lower part and blues, greens, tans and metal shades. Gray is also used with black.

In sports hose the two color combinations are featured, but as one manufacturer stated the striking plaids and stripes do not appear to be wanted as much as the plain colors.

Among the new outerwear garments are several knitted dresses and suits for children, which have been featured in New York and vicinity in particular and some "Shetland" wool slip-ons in pastel shades have been among those receiving attention to wear with the plain colored skirt. Used as a blouse for the juniors it is believed this type of garment will find favor for spot and future delivery. Many of the new blouses of this sort are made of white having dainty figures, stripes or plaids in the pastels.

Some tasseled caps are among those shown for skating and winter sports in prominent colors, with red featured at the present time. The old time tam is among those finding favor, and it was said that smaller close fitting caps will also be included, since retailers have been especially interested in these numbers because they have been entirely different from anything shown for several years.

With some of the new sports coats and heavy sweaters has been sold some ends of wool matching the coat, so that the skirt or hat can be embroidered to match the coat.

Brown is one of the most promising colors this season in outerwear knit goods, it has been said and many different shades have been featured in the new collections.

Using One Knitter on Two Leggers.

The Federal Knitting Co., Philadelphia, manufacturers of women's full-fashioned silk hosiery, report having declared finally for the non-union plan of operating the plant and having one knitter operate two leggers. This declaration followed, a week or two ago, the calling of a strike by the local branch of the American Federation of Full Fashioned Hosiery Workers, who since October 31 have been picketing the mill, a woman and five men patroling the street in the immediate vicinity. The mill management reported some disorder, and two policemen were afterward kept on duty at the mill. It is related a number of arrests were made and that two women were held in bail to keep the peace.

Two weeks after the strike was inaugurated the com-

More than ever before Men are wearing Fancy Hosiery

The widespread popularity of fancy stockings among men of today, is constantly growing, with the result that a greater variety of patterns is necessary. The manufacturer, who has the equipment that is capable of producing the greatest number of styles, with the least effort is sure of obtaining his share of business.

The Standard line of machines, with the various attachments, offers the hosiery maker a means of enlarging his field. These knitters have practically no limit in range of pattern change.

The pattern shown here was made on a Standard H Knitting Machine with the Attachment "R", style 2. This produces figure patterns in six colors. A real feature of this machine is the ease with which patterns can be changed. The operation is without the use of jacks.

Our catalog, which fully describes these knitters will be of interest to you. Ask us for it.

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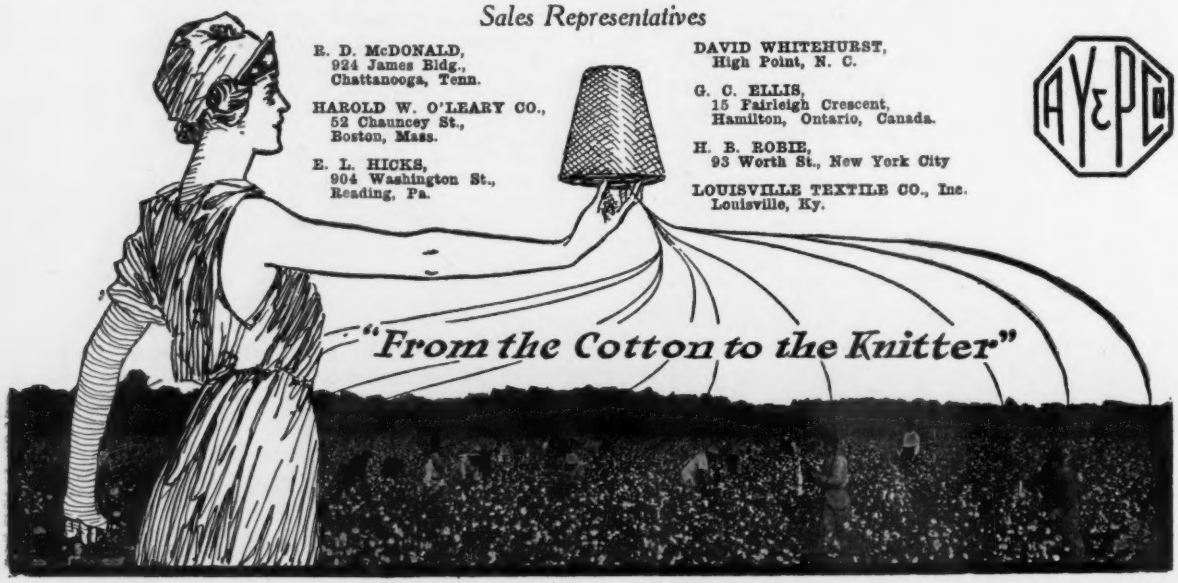

pany reported operating to 50 per cent of capacity with new help, while turning some applicants away until all of the departments could be reorganized and made to synchronize. The company has had the cooperation of the Philadelphia Textile Manufacturers' Association, whose membership embraces most of the Philadelphia full fashioned mills. This is stated by C. C. Williams, the managing executive, who said, "hereafter we shall operate on the non-union plan, with the two-machine principle." This is the fourth mill in the city to adopt this plan. The mill was operated as an open shop until the strike occurred. Additional 42-gauge machines are being installed.

Among the Knitting Mills.

Lenoir City, Tenn., has been selected by the Alspach Knitting Co., of Orwigsburg, Pa., for a mill to manufacture underwear. A. Scholcan, Inc., will locate a silk mill at Maryville, Tenn., according to representatives of the Tennessee Electric Power Co. Aronsohn & Hirschfield Silk Mills, Paterson, N. J., are to establish a plant at Morristown, Tenn.

Chipman-Burrowes Hosiery Mills Co., of East Flat Rock, N. C., have added to the equipment of their new branch plant at Dana, N. C., to bring the equipment to 50 240-needle Banner machines.

McDonald-Heathcote Hosiery Mills, Thomasville, N. C., which has been operating in leased quarters, will remove to its new plant where additional equipment will be installed.

Smithville Hosiery Mills, Smithville, Tenn., have been incorporated by L. W. Smith, C. H. Denton, Charles King, B. W. Foster, Worth Crowley, and others. The capitalization is $26,000.

A new mill will be erected by Nebel Knitting Company, Charlotte, N. C. Full-fashioned hosiery will be manufactured. The plant will be two-story, 53x160 feet, of brick construction.

Girard Hosiery Mills, Thomasville, N. C., recently organized, will erect a two-story, 60x150 foot building for the first floor; the second story being 60x80 feet.

The full-fashioned equipment of the Elizabeth City Hosiery Mills, Elizabeth City, N. C., includes the following: four full-fashioned machines, Theo. Lieberknecht Type H.S.L., from Alfred Hofman, Inc.; Universal winders; Union Special seamers; loopers from Southern Textile Machinery Co.; and steel equipment from David Lupton Sons Co., Philadelphia.

An eastern company has taken over the property of the Barnes Knitting Company, at Cedartown, Ga. It is understood that the new owners will revamp the property and install modern equipment for immediate operation, which will practically double the capacity of the mill. Charles Adamson, president, Cedartown Cotton & Export Co., was largely instrumental in interesting the new capital.

The properties of the Oak Lane Knitting Mills, Murphy, N. C., have been acquired by the Murphy Real Estate Co., which will place the plant in operation on a reorganized basis.

Bryant Woosley and associates, of Shelbyville, Tenn., have purchased full-fashioned equipment, and will soon begin installation and production.

Montgomery Knitting Mills, Summerville, Ga., have been organized by E. Montgomery, formerly superintend-

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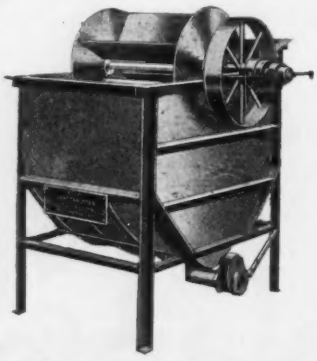

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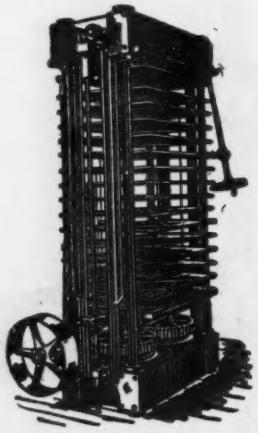

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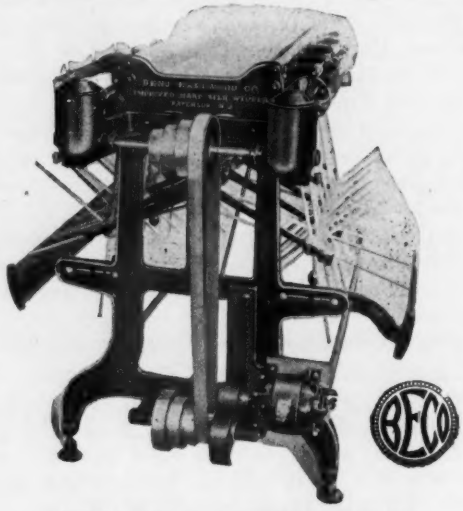

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ent of Summerville Cotton Mills; E. W. Sturdivant, of Atlanta; and F. F. Chapman, S. C. Martin, Sam Pollock, J. H. Edge, and others of Summerville. It is understood that rayon garments will be manufactured.

Jersild Knitting Mills, Neenah, Wis., have been reorganized, this change being effected through the transfer of stock formerly owned by L. J. Pinkerton, secretary and manager, and E. E. Jaudrey, to C. M. Jersild, N. C. Jersild and W. I. Pearson. C. L. Madison will continue as president, with Gustave Kalfahs, vice president, and Mr. Pearson as secretary and general manager.

Using Rabbit Fur in Knitting.

Using rabbit fur in knitting, in combination with Viscose rayon, is discussed by a writer in a recent issue of the "Canadian Textile Journal." He says.

"At the present moment, certain branches of the textile industries are busily engaged in manufacturing a yarn which possesses as dominant features, softness and brilliance, and which, on account of this, is quite popular with feminine purchaers, who use it for knitting purposes. Its several advantages are that it does not felt easily, and it is comfortable to wear, being light in nature, fluffy and ideal as a knitting yarn.

"There are several qualities, and the prices are variable. This yarn is one belonging to the Angora species, and is found to be a mixture of Viscose and rabbit fur. Rabbit fur alone has been found very difficult to spin and will not stand much friction, as the fibers are so flimsy that ordinary atmosphere disturbs it considerably. This means that when washed great care must be taken as water agitated only a little will make the rabbit fur disappear completely. Again, it must not be brought into contact with excessive moisture, as the fibers are easily disarranged, and not suitable for satisfactory knitting.

"A new use for this, however, has been the introduction of Viscose, which has stabilized it a little, as Viscose possessess long straight filaments with no serrations or interlocking properties, and has to be spun in a dry atmosphere to obtain the best results. Water has been found to weaken the fiber, and it is at this point it is liable to break and become hairy. Viscose is sensitive in its composition, and is composed of fine separate filaments continuous in length, and when strain is put on them they break and remain straight and firm. Viscose alone will wash satisfactorily, provided simple precautions are taken, and in some cases, it improves the color and handle.

"By blending the Viscose and rabbit fur in some unknown proportions, a yarn is produced of a soft nature, bright and inclined to be slippery in its characteristics. The yarn is covered with short fluffy fibers, and particularly noticeable are the long separate fibers which protrude, and which are Viscose.

"The general yarn which is used for knitting purposes is a three-fold one and is similar in thickness to a fourfold 12s worsted of a similar quality. A minimum amount of friction is given to it as the turns are 83 per inch. This is just sufficient to permit it to be wound into balls without undue breakage. The average strength of this yarn is 1½ pounds with an elongation of 1 7/16 inches and the fibers do not snap and break as is the case of Viscose alone, but give at the weakest point and allow themselves to be drawn apart."

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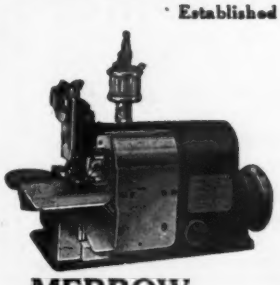

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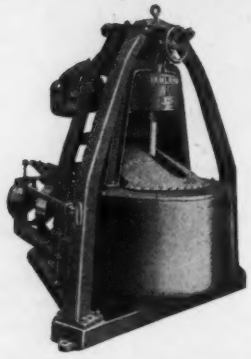

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The writer illustrates a microscopical section of a rabbit fur, which, he points out, shows it to be composed "of a variable sized medulla, and a cortex which is also variable. The medulla is composed of oblong matter, which is built up continuously inside the fiber, and which varies in its diameter." A microscopical section of Viscose yarn, he says, shows a "continuous straightness of the fiber, with stiff long threads, forming the composition of the fiber." He calls attention to the fact that these threads "do not entwine each other, but are perfectly parallel."

These factors, he says, "are disadvantages to felting, which is in most cases a partial requirement of some knitting yarns required for density of texture. If we desire good felting properties, we must have fibers with compact scales, overlapping, with sharp points, and of which a number of them can be arranged in a criss-cross way that they will assist felting or fulling. Rabbit fur and Viscose possess none of these characteristics, and that is why it is not so susceptible to felt.

"Excellent novelty yarns can be made from various combinations of these fibers, and they are found to be of best use when introduced with other yarns to make certain kinds of knitted goods, viz., for the edges of ladies' jumpers, etc.

"Rabbit fur and Viscose is not too durable, although for novelty and dyeing effects it is quite useful to the knitting trades, and can be put to some very useful purposes. Viscose and rabbit fur when blended together is sometimes used in a natural color, and others are dyed to various shades.

"Either an acid or direct cotton dye will prove fairly satisfactory for dyeing and it has not a great affinity for dyestuff and it is noticed that the yarn is not too uniformly dyed. The Viscose stands out in brilliance, and here and there several fibers may be observed to have escaped dyeing treatment, although the result to the naked eye is quite satisfactory."

This material, it is stated, has been used in the hat industries, and also for ladies' wraps, sport clothing, etc. The producing rabbit is mostly the Angora, which produces about 7½ ounces of wool in a year.

Rhoads Celebrates 225th Anniversary of Founding.

At the recent convention, the sales force of J. E. Rhoads & Sons presented the firm with a loving cup in commemoration of the 225th anniversary of the founding of the business in America. A motto from Proverbs was inscribed on the cup—"Through wisdom is a house built; and by understanding is it established." The Rhoads tannery was started near Philadelphia in 1702. The leather business had been carried on in England previously by at least one generation. At this convention, announcement was made that all brands of Rhoads leather belting will now be made regularly with waterproof cement and waterproof treatment.

Oakite Service Conference.

The annual conference of Oakite Products, Inc., service men was held in New York November 7-10, for the discussion of cleaning and related problems, as well as to celebrate the 19th anniversary of the company's industrial cleaning service. Papers covering a wide range of subjects, devoted to cleaning problems in different industries, were presented.

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Adjustoe
METAL DRYING FORM

The Yarn Market

Philadelphia, Pa., Nov. 18th, 1927.

During the past month conditions in the Philadelphia cotton yarn market have not been thoroughly satisfactory from every standpoint.

There has been nothing of an encouraging nature from the standpoint of transacted business, only small commitments coming through. Inquiry has continued fairly strong, but the influence of cotton price changes and condition reports was sufficient to offset any appreciable improvement in actual business as a result of the inquiry.

During the first of the four weeks considered here, which began with October 17th, it seemed that previously buyers had been deferring action awaiting lower values, and that, finding them, some activity would result. Dealers exerted pressure particularly on the strength of the low level reached by cotton, pointing out the possibility of complications as a result of a rebound in prices. There seemed, however, the necessity of a stronger force to secure movement from the buyers.

Within this week, there was some discussion as to concessions being granted, by direct selling mills and others, in order to move yarn found on hand. There was report also of some trading between the dealers themselves in small lots of yarn. Neither of these tendencies, however, was of sufficient magnitude to affect the general condition of the market.

One development of interest, however, was a strengthening in the stand taken by the dealers in this market. In the face of no business, they seemed more determined to maintain prices, and it is currently believed that such practices as splitting commissions have been eliminated. It is also felt that there is considerably less speculation in carded and other yarns. All of these tendencies must have a wholesome effect upon the underlying position of the market.

The next week started off with a decline in rates, the drop in cotton in the previous week being held largely responsible. Combed yarns experienced a sag in price, due in the main to reports showing an improved outlook for the long staple cotton crop. Combed yarns had been moved up more or less rapidly by spinners entirely in self-protection because of the bulge in the values of the cotton used. During this week, an improvement in the position of cotton influenced yarn rates somewhat, although the rates were advanced irregularly. There developed an increased interest and more inquiries, these being induced largely by the rally in cotton.

The possible sources of low priced yarns, and the actual amount of stocks in the hands of dealers, were the subjects of comment during the next week. This period was practically a duplicate of the previous week, reflecting thereby a lack of development in regard to cotton itself. The advent of the eleventh month, coming within this week, made no change in the status.

The fourth complete week, ending on November 12th, brought the government's report of 12,842,000 bales for the cotton crop. While the increase somewhat surprised the market, which had guessed around 12,500,000 bales, there was no upset as a result of the report. Following it, there was some increased inquiry, but this seemed to be the only effect. Prevailing throughout the entire month, and extending into the present week, there has appeared an attitude of complacent waiting on the part of customers. With end-of-the-year inventory time getting closer, they do not wish to increase their figures of last year as to yarn on hand, and have accordingly continued their practice of buying in small lots for immediate use. In fact within the past few days have come requests from a number to hold up on yarn shipments already ordered, this explanation being assigned as the reason for such action on the part of market factors.

Philadelphia quotations on November 16th follow:

Single Skeins.

4s to 8s	32 @32½	10s	32½
12s	33	14s	34
16s	34½	20s	36
24s	37½	26s	39½
30s	40½		

Single Warps.

8s		10s	33
12s	33½	14s	34½
16s	35	20s	36 @36½
24s	40 @40½	30s	41 @41½
40s	50 @51		

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	33½
8s and 9s tinged tubes	30½
8s 3-4 hard twist waste	29½

Two-Ply Skeins.

8s	32½	10s	33
12s	33½	14s	34½
16s	35 @35½	20s	36½
24s	38	26s	40 @40½
30s	41 @41½	40s	50

Two-Ply Warps.

8s		10s	34½ @35
12s	35½ @36	14s	36½
16s	37	20s	37½ @38
24s	39½	26s	41
30s	42 @43	40s	52

Frame Spun Carded Yarn on Cones.

8s	33	10s	33
12s	33½	14s	34½
16s	35	18s	35½
20s	36	22s	36½
24s	37½	26s	39
30s	40½	40s	50
30s double carded	42	30s tying in	38

Two-Ply Combed Peeler Skeins and Warps.

8s	47	16s	47½
20s	49	24s	51
30s	53 @54	40s	58 @60
50s	67 @69	60s	75 @79
70s	85 @90	80s	95 @$1.00

Single Combed Peeler Yarn on Cones.

18s	45	24s	46
30s	52	36s	56
38s	57	40s	60

Mule Spun Carded Yarn on Cones.

10s	38	12s	38½
14s	39	16s	39½
18s	40	20s	40½
24s	42	26s	43
30s	45	40s	56

Mule Spun Combed Peeler Yarn on Cones.

10s	46	12s	47
14s	48	16s	49
18s	50	20s	51
22s	52	26s	54
28s	55	30s	58
36s	61	38s	62
40s	65		

Charlotte Plant of Lambeth Rope Corp.

Rapid progress is being made in the recently established plant of the Lambeth Rope Corporation, in the Wade Loft Building, at Charlotte, N. C. This company has for years operated the home factory at New Bedford, Mass., and the Charlotte plant is established in order that the company may be more closely identified with the southern industry. The company makes spinning and twister tapes, and other narrow fabrics, using specially constructed looms with high production. H. W. O'Leary is president, and will remain in Charlotte for the first year of operation to supervise its work.

LEESONA NO. 60 GF UNIVERSAL CONE WINDER

THE LEESONA TARGET

"The Solution of Every Winding Problem"

Two essentials to success in any business are a *clearly defined target* and an *unwavering aim*. A third of a century ago the Universal Winding Company established for itself, as a goal or target, "the solution of every winding problem." Since then this Company has built over 2,000,000 winding spindles and marketed over fifty different kinds of winding machines. Many of the originals are still the only outstandingly successful mechanisms of their kind on the market.

This Company is at present the largest organization in the world making winding machines exclusively. Supremacy in size is the logical result of supremacy in demand. Supremacy in demand follows leadership in conception, execution, materials, and service.

PRODUCTION · DOUBLED ·

THIS installation of seven No. 60 GF Leesona Universal Coners (672 spindles) in a well-known southern plant prepares cones for high speed warping from a Leesona Magazine Cone Creel. Since these machines handle work for which 1350 spooler spindles were formerly required, they have more than doubled the production per spindle formerly obtained.

The No. 60 GF machine is also adaptable to winding cones for knitting or for shipping purposes, and its performance in these fields is just as satisfactory and just as economical as for high speed warping. Equipped with ball bearings, it requires less than 3 h. p. to operate 96 spindles at a constant yarn speed of from 450 to 600 yds. per minute.

The economies and advantages resulting from this high speed and from other features of the machine are many and far-reaching. Complete details will be furnished on request.

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UNIVERSAL WINDING

Ad. No. 6—Printed in U.S.A.

COLOR

Handkerchiefs
by courtesy of
ACHESON HARDEN CO.
New York City

Bath Mat
by courtesy of
DRIAD MILLS
Philadelphia

THE MASTER SALESMAN

A few years ago about the only function of the handkerchief was that for which it was originally intended. It was generally white (in fashionable circles) and was kept out of sight until needed.

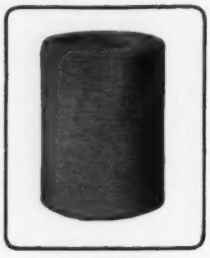
Then *Color* was introduced, and since that time handkerchiefs have successfully competed with neckties and hosiery for attention and admiration.

Whereas in the old days handkerchiefs were tucked away in boxes on retailers' shelves, today whole windows are given over to this useful and decorative clothing accessory, and sales have increased in proportion.

As to bath mats, here's what Driad Mills say:

". . . can fairly state that colored bath mats and colored towels greatly outsell the plain white ones, and that colors are a big factor in the sales. In fact, today, people seem to want more color than ever before. We have been able to give them this through the very fine work of the Franklin Process Company."

The last sentence, by the way, was unsolicited, but it shows clearly what users think of Franklin Process Dyeing and Service.



A Franklin Package of Dyed Yarn.
It will deliver freely by rotation or over end.

We dye and deliver yarn in the wound Franklin Package form (or deliveries can be made in other wound forms if desired). The Franklin Package will rotate in a creel like a spool of gray yarn or deliver over end like any parallel tube. This means the elimination of skeins, chain warps, and the attendant waste, and extra machinery and labor necessary in handling them. Many mills report savings of 5 cents per pound, or more, in winding costs.

Penetration of the colors is excellent due to the pressure dyeing method, and the strength of the yarn is unimpaired as the yarn does not change in twist.

Deliveries are consistently good. We carry some yarns in stock all wound, ready for dyeing; under these conditions, if necessity requires, we can often make shipment in two or three days after receipt of order.

Are you interested in making more sales and profits through the use of COLOR?

. . .

We would appreciate the opportunity to study your problem.

Write us today.

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also Yarn Spinners, Manufacturers Glazed Yarns, Dyeing Machines
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FRANKLIN PROCESS

Commission Dyeing of Yarn in the Wound Form

Ad. No. 227. Printed in U. S. A.

The Knit Goods Market

The primary markets for hosiery have come close to getting into their Fall stride. November was a month of steady buying for current needs and the placing of some business for Spring. Women's silk hose was outstanding for activity, with retailers stocking up conservatively for their holiday trade, and the better grades of standard lines suffered little from price irregularity. Some few mills are, however, sacrificing holdings of short boot full-fashioned and mill overages, which are taken by large department stores for pre-holiday special sales, at prices which to some extent have a disturbing effect on values generally. Seamless silk from southern mills find a ready outlet profitable to manufacturers and merchants, and most of the northern product of this class keeps moving steadily into distribution.

Business in underwear for winter is at a satisfactory stage, but developments in raw cotton are a cause for no little anxiety concerning the opening for 1928. As the new prices will, it appears, be made on a declining market, it is thought in some quarters distributors will stand out for more in that respect than manufacturers should be willing to extend, and that contracting at the opening will proceed slowly, depending on whether manufacturers take a firm attitude and adhere to it.

Hosiery trade factors figure on a recession from the Fall volume of business following the holidays, and believe that in average lines manufacturers may find it expedient to slow down on production. This would be a repetition of what was experienced in January in recent years, a logical halting after a period of briskness. It is intimated the policy of manufacturers may be dictated in no small degree by the end-of-year inventory showings, for, it is pointed out, credits are going to be more carefully digested at the beginning of the year, admittedly fraught with some uncertainty.

Two classes of hosiery in which the present situation is especially disappointing are wool hose for adults and juveniles, and infants' socks. According to a tabulation of mill reports to the Department of Commerce, there is indicated an increase in the production of all classes of wool hose this year, while a shrinkage in sales, if the reports of mill representatives be accepted at their face value. Output in September was around 30 per cent more than for the corresponding month of 1926. As distributors had bought ultra-conservatively, it was believed by manufacturers their late purchases would bulk large. They had not taken into consideration the possible results from weather vagaries.

On the strength of a good volume of business in 1926 and the year previous, distributors last year stocked up quite liberally. Their sales at the beginning of this year showed a material decline, notwithstanding a protracted cool spell in the Spring, and it is related some stocks were either sacrificed or carried into the present season. Jobbers therefore have been shy about contracting in anticipation, and it is said to be tradition that they buy very little in December and later, for stock, so that this year, if production has been fairly indicated, it will be the mills that may suffer. Retailers will doubtless do some replenishing to the end of the year, if low temperatures prevail, but regardless of weather, will, it is predicted in the trade, take in very few goods in January. The situation involves men's, women's and juvenile lines.

With a fondness for silk, women are wearing less wool hose, it is asserted by observant factors, for one reason the gauzy understocking makes silk more acceptable for severe weather use. Sales of worsted underhose this year have been large enough to lend support to this conclusion, and account for the popularity of chiffon silk for winter.

Business in infants' socks for the 1928 season is seriously lagging, some primary interests estimating that to November but little more than 50 per cent of last year's volume had been placed. Practically all of the leading jobbers have contracted, but on a conservative scale, while numbers of the smaller houses are said to have yet to enter their initial orders. A few mills report sold up to April of their more popular numbers, but such reports are exceptional. As some few jobbers say they have booked a fair amount of sock business for Spring, it would appear others are underestimating their requirements, and that mills will be under pressure for deliveries late in the manufacturing season. Most of them are at present well engaged, whereas not so many weeks ago some of the better known were not operating their plants.

Two reasons for jobber hesitancy to stock up with infants' socks are assigned by one of the better known operators in the New York markets. One of these is that chain stores have established an enormous business in popular price lines, usually underselling individual stores by a nickel a pair, and that therefore socks are a more precarious proposition for jobbers. Another explanation is that it is customary for distributors to contract for an unnecessarily wide range of patterns of medium price goods. They have no difficulty in disposing of the more attractive designs, but withhold reorders while trying to force the less desirable. Some business is thus lost to them, and leftovers of slow moving patterns must be sacrificed.

It is noted that the manufacture of infants' socks never has made much of an appeal to southern mill chiefs, who, however, are going strong on children's golf and dress-up hose in patterns, mainly for the popular price brackets; men's fancies and women's seamless silk. It is stated by mill representatives who are established in New York that in the Piedmont section there is scarce a manufacturer who for some time has not been running his plant 20 hours a day, employing two shifts of operatives. A selling agent for eight non-competing mills says six of them in November were operating on a 20-hour schedule, as they had been for some time, and accumulating no stock.

Southern manufacturers are reported especially well situated as to business in juvenile lines, from plain carded and combed ribs to what is described as golf hose and the more classy in construction. Mercerized to go over the counter for 25 cents is an important item with several of the leading mills rated as the stronger rivals of those in the North. But it is believed the cream of the business is in half dollar goods, in which some noteworthy patterns are shown.

The Scotland Neck Cotton Mill, one of the older North Carolina establishments, felt somewhat flattered when a few weeks ago Ruth Elder, in a sport costume, was found to be wearing a conservative pattern of hose from that mill. Having an oxford background, relieved by diagonal stripes, it was designed by the superintendent, W. H. McDowell. Major A. McDowell, president of the Scotland Neck, it is appropriate to say in passing, began making hosiery in 1889 and therefore ranks among the pioneers in the industry in the South. His selling organization, main office in New York, recently established a branch in San Francisco, having previously opened an office in Chicago. The New York office, in charge of W. O. and A. McDowell, Jr., is at 93 Worth street.

Probably in no class of hosiery is there broader and keener competition than in men's novelty socks, nor is there any class that presents more perplexities for primary interests. Fancies are and for some time doubtless will be the liveliest corner in half hose. New patterns to pass to the consumer for a half dollar are readily salable, but they do not long remain new, innovations following in uncomfortably close succession. That is what is causing manufacturers and mills agents most concern, particularly as to the higher price numbers. A very few months ago complaint was heard of a scarcity of good dollar socks for the jobbing trade. Since then more of what was intended for that bracket have come on the market, yet disappointed sellers ask where they are to found. The answer is, in the 75 cent division, for there was much copying of fetching patterns, which manufacturers found it desirable, from the standpoint of increasing their sales, to offer at prices materially reduced from original quotations. There are few secrets in the hosiery trade, say sellers whose patterns have been copied even before they had commenced making deliveries of designs which they believed would be theirs exclusively long enough to realize on their investment in new striping devices.

At about the same pace that dollar novelties slip into the 75 cent division many of those for that retail price make their appearance on the half dollar counter, so that it appears the originators of the more aristocratic numbers supply designs for competitors who aim to make popular price lines. But it develops that there are limitations for competition of this character. It is related by several buyers that two mills in Burlington, N. C., have in their 50 cent numbers patterns with which the 25 cent socks cannot compete and which are not materially affected by offerings of exclusive designs of higher price goods.

Some popular half dollar socks in patterns are of silk and rayon in combination, an advance from the rayon-and-mercerized of a year or more ago, which leaves a narrowed field for more lofty types of construction. It appears that for a long pull silk-and-rayon is the better proposition as measured by volume of sales and leaving out of consideration margin of profit per dozen. There is a wide-open market for 25 cent fancies, and some factors declare this is one line in which there appears underproduction. Novelties for all the year around wear are said to be detracting from the sales of pattern wool hose except of foreign make, often commanding fancy prices because branded "imported," a marking that enables retailers with an exclusive clientele to obtain silk prices for lisle socks.

If production statistics are approximately truthful, silk half hose is slipping more than cotton. Output in September last was less than in August and less also than for September of last year, this being true of both full-fashioned and seamless. It is noted that a well known manufacturer of high grade seamless recently entered the novelty field, notwithstanding it is more crowded than silk. Novelties as a broad proposition appear safer for manufacturers selling under their nationally advertised brands, to the retail trade, than for those distributing indiscriminately through jobbers. They seem better able to forecast the life of a pattern and maintain prices. In any analysis, the fancy half hose game is one of many perplexities, usually returning less than the estimated winnings.

The markets for women's silk hosiery show almost complete recovery from the summer slump. Although production is steadily on the increase, prices are less irregular and demand is well sustained. Not all of this is to be ascribed to interest in holiday goods, for some substantial contracts for Spring deliveries of full-fashioned are being placed, notably with the larger northern mills. Considerable of this forward business comes from manufacturers of restricted lines who sell direct to the retail trade, and who probably find it more feasible to buy for the great part of their distribution than to expand their plants—for example, establishments of the character of Brown Durell & Co. and Gotham Silk Hosiery Co., jobbers as well as manufacturers.

In a broad way, jobbers are playing an increasingly smaller part in distribution of full-fashioned hose, particularly since more manufacturers are selling much of their product in stores under their own control and chain store owners have gotten into the field of manufacturing. Beginning with one store seven years ago, Bergers' Inc., now operate seven in Philadelphia, three in the shopping center, where it is believed more hose is sold than in most of the more pretentious shops in the same city. Last month another concern opened the first of what is to be a chain of six stores.

Between the chains and the direct-to-retailer mills the jobber seems destined to be almost eliminated as a distributor of full-fashioned silk hose, but this appears to be food for mills, as production is increasing, which means consumption is greater. A Philadelphia manufacturer of full-fashioned and spring needle silk, selling to both the jobbing and retail trade, has plans for selling direct to consumers through a chain of stores intended to be established shortly.

Manufacturers distributing in the old fashioned way report a steadily increasing demand for finer than average gauge. Most 45-gauge machinery is being operated to capacity, much of it 20 to 24 hours a day, with output short of the business offered. Manufacturers complain, however, that it is difficult to obtain adequate prices in competition with 42- and 39-gauge. So many buyers are unable to discriminate that they are easily deceived by appearance, and compare prices for one gauge with those of a coarser one. More of 45-gauge is being installed, however, from which it is deduced manufacturers find it a better proposition than some represent it. One goes so far as to insist that buyers should insist upon a guarantee as to gauge. This is not favored in the trade generally, as eventually there will be as much competition in any one gauge as between coarse and fine. Besides it is of no more interest to shoppers than knowledge of the pick in woven cloth, it is pointed out, so long as construction, appearance and presumed durability appeal. Too

much detail of description would only add to confusion for sellers, it is held, and serve no good purpose for the ultimate buyer.

That prices are pretty well settled, on a low level, is indicated in the fact there is little difference—often none—between those of northern and southern mills. In fact, an executive of a North Carolina mill said recently that "if we had to sell our full-fashioned hose for what some mills in the North are reported accepting, we would either look for another market or close the plant."

The healthy condition of the market is shown in the stage of operation by numbers of small concerns. The Vogue Silk Hosiery Co., 45-gauge, is on a 24-hour schedule, as is Emmeth Textiles, Inc., one selling to jobbers and the other to retailers. Both are in Philadelphia, and the Howard Hosiery Co., in the same city, which recently installed 45-gauge machines, reports production sold up for several months. These mills are selling mainly for nearby delivery. The Apex Hosiery Co., selling to jobbers, is said to have sold up to June, and it is understood the pointex heel stocking represents a considerable part of the output. This onetime novelty seems anchored as a staple, being an exception among innovations in heel construction. There are possibly twenty or more types of heel on the market, but the aggregate production is limited, although mills equipped for turning out several forms are crowded with business and operating overtime.

An objective of manufacturers of full-fashioned is a standard stocking to be sold profitably for a dollar a pair. Such a stocking looms as a possibility in both 39-gauge pure thread silk to welt and silk in combination with rayon. The latter is coming from an increasing number of mills combining either Bemberg or Celanese with silk, but not for the dollar bracket, for which less costly types of chemically produced yarns can be used.

While there is an indicated steady decline in the production of seamless silk, distribution is at a healthy stage, with numbers of mills booked well up. A right good stocking with pointex heel goes to jobbers for $6.50 a dozen, competing with mill lines quoted at 25 cents less. It is claimed by manufacturers of seamless that they are supplying a better stocking, silk to top, for the dollar class, than it is possible just now to knit full-fashioned. It is the jobber's best item in silk hose. Conspicuous in the seamless division is the 300-needle stocking, for which demand has been running ahead of mills' facilities. That there is confidence in its future is indicated by the fact some few manufacturers are installing additional equipment.

With hosiery of silk and rayon in combination available as a 75 cent seller, there is narrowing demand for all-rayon goods. Comparing with September, 1926, there was an indicated decline of around 50 per cent in production in the corresponding month this year and a drop also from August. The onetime popular rayon stocking appears to be held in less trade respect than mercerized and figuring less in consumption than low end cotton. Output of women's cotton hose, including mercerized, shows some increase, and manufacturers' reports make it appear as greater than the aggregate of rayon and rayon and silk in combination.

In the drift from one type of construction to another it is not difficult to account for varying conditions in the hosiery markets. The trend to full-fashioned silk is made clear in statistics covering production for the first nine

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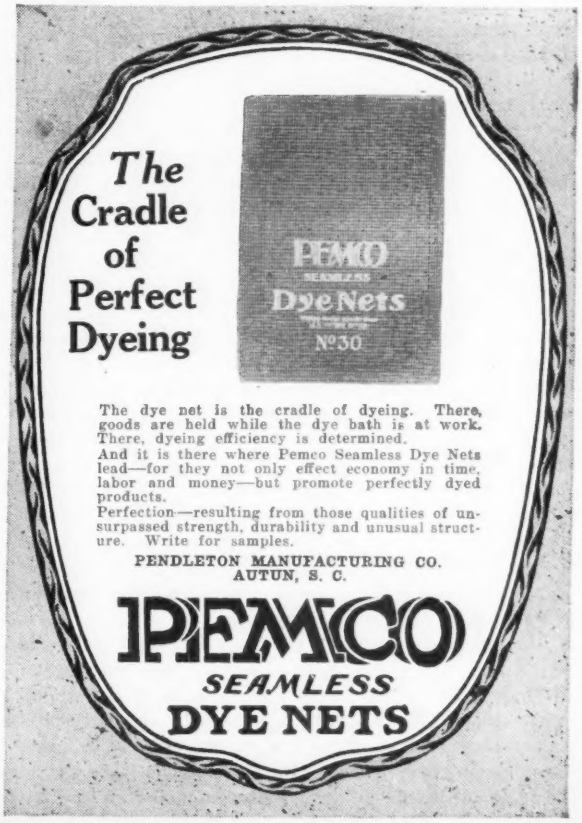
Burke County Trust Bldg. 186 W. Jackson Blvd.
CANADIAN REPRESENTATIVE
Slaters, Ltd., 53 Yonge Street, Toronto, 2, Canada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DYE NETS

months of 1927. To September 30 there was an indicated output of 10,392,308 dozen pairs, comparing with 8,667,793 dozens in the corresponding nine months of 1926. Seamless is shown to have fallen to 1,790,629 dozens from 2,214,544. Considering there also is a drop thus far this year in seamless pure thread silk and silk and rayon in mixture, the increase in full-fashioned is readily accounted for, and it would appear the scare over excess production was premature. Hosiery still may be said to be near first place in textile manufactures.

Underwear.

A changed aspect was given to the underwear primary market situation by the November recession in cotton. Interest in heavy weight cotton ribs necessarily is focused on the opening of mill lines for 1928. Leaders among the southern group of manufacturers favored coming on the market not later than the middle of December, and were apparently hastening the staging of the formality by offers to accept business at any time in the interim at prices to be adjusted to the opening level. This eagerness to start the 1928 ball rolling was the cause of no little adverse criticism in the North, where manufacturers usually are slow to fall into line.

One southern mill was reported having booked an order from a jobber for more than 100 cases, for 75 cents a dozen less than the accepted price for current delivery. This was regarded by some as jeopardizing orders for deliveries to the end of December and giving an incentive to buyers filling in for this year's needs to insist upon recessions from list prices. The price meant nothing as to next year's commitments, as it was subject to revision downward following the opening, but not upward. Buyers accepting the terms were protected against advances over current values and therefore appeared to have nothing to lose. But it is understood, and stated by some large jobbers, that there was no rush to take advantage of the open price proposal.

It appears the majority opinion among northern jobbers that an opening in the first week of January would be sufficiently early. Some say they will not name 1928 prices this year, regardless of what others may do. A southern mill representative favors December 15 at the latest, and there seems little doubt that by that time a fair volume of inside business will have been booked, much depending on average temperatures. Although jobbers are but lightly stocked, some fear that as retail sales lagged during the October and November abnormal temperatures they may be left with high price underwear to be carried in their inventories, with small chance of making a clean-up in January. That weather will be the dominating factor in the stage of business for early 1928 deliveries is generally admitted.

Manufacturers and jobbers will close the year profitably. For them the rise in cotton following the first of the government crop estimates was opportune. It made for instant demand and an orderly market for the remainder of the heavyweight season. What disorder may develop will center about the opening.

Manufacturers comment on their increased sales of shirts and drawers this year. One mill had sold production up to the first of January as far back as September, while still offering union suits for nearby and late deliveries. Others tell of a spurt in the two piece suits, as do some of the larger jobbers. But, it is stated, there was no comparable decline in the business in union suits, from which it is inferred that there was an all-around larger volume of business in heavy weight underwear, which might be ascribed to low prices to about the middle of Summer stimulating buying by the trade. Some mills established new records for shipments to November, and several of the light weight establishments already have booked as much business as for the whole of 1926.

In the gains for the next light weight season, ribs appear to have scored heavily, with bal briggans holding their own. That nainsook athletic suits seem not promising of retaining their onetime measure of popularity is believed by manufacturers of the knitted. A manufacturer of both ribs and nainsooks reports the latter slipping, although a fair amount of business has been written. That the ribbed is coming back is attributed to persistent advertising by organized manufacturers and to overproduction of standard nainsooks and cheapening of unidentified lines. Not only have the cheap goods demoralized the situation for manufacturers of branded goods, but have brought nainsook underwear into disfavor, according to some market authorities, who see little relief from present trying conditions so long as nainsooks can be produced in lofts where the only equipment is a few sewing machines and a cutter, and from these so-called factories peddled to retailers at prices which seem low but, taking account of the dissatisfaction with the garments, are high.

Not only have manufacturers sold heavily of light weight underwear; some of the more responsible jobbers report sales to retailers bulking big. The dealers bought earlier and more liberally than usual, it is stated, despite recollections of the protracted cool Spring and its adverse effect on the business in summer weights. Some reorders have been placed with mills. The bulk of the duplicate business is expected to not come along until the trade is pretty well satisfied there will not be next year a repetition of the weather conditions of the Spring of 1927. Mills will have meanwhile enough orders to keep them well occupied through the winter, a better start than was made last year.

Sweaters.

Finishing better than in any recent year, sweater mills are after orders for 1928, while still filling small orders from jobbers who had continued their policy of buying as they sold. There were retailer cancellations during warm Fall periods and for a time the primary market wore a holiday aspect. But the retailers came back, and demand for spot goods in November was greater than some mills were prepared for.

It is too soon to estimate results from the sweater opening in the middle of November. It should cause no great amount of surprise if buyers do not operate actively until in January, as prices are based on comparatively high cost yarns. Worsted yarns are firm on a higher level than prevailed for some time, but as it is common knowledge trading in domestic wool fell to a low stage in October-November, there exists a fear the raw material may suffer some little decline, as was the case in December in each of several recent years. And there still is the matter of winter temperatures to be reckoned with.

Cooper-Hewitt Moves.

The general offices of the Cooper Hewitt Electric Company have been removed to the company's new building at 410 Eighth Street, Hoboken, N. J.